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By S. S. YUDIN

CHIEF SURGEON TO THE SURGICAL CLINIC OF THE SKLIFOSOVSKY INSTITUTE, MOSCOW; DIRECTOR OF THE SURGICAL CLINIC, POST-GRADUATE MEDICAL SCHOOL, MOSCOW

THE idea of using Prof. Shamov's experimental data to attempt the transfusion of cadaver blood in man occurred to me when he first reported his results in dogs in September, 1928. A that time I had under my charge the entire surgical and accident departments of the Sklifosovsky Institute—the central hospital for emergency surgery in Moscow, with its population of nearly four millions. Among the 8000–10,000 emergency cases passing through my control annually there were a very large number urgently needing blood transfusion. Many arrived late at night and it was difficult at times to find suitable donors at once. At the same time the first-aid ambulances very often bring to the Institute cases with trauma or acute cardiac failure so severe that they die in the receiving room or even on the way. Under such circumstances it would be possible almost any day to procure fresh cadaver blood of a suitable group.

While in Prof. Shamov's experiments on dogs the misgivings about the danger of so-called cadaver toxins were allayed in man there is the additional complication of syphilis. The Wassermann reaction had to be carried out in the quickest possible time, assuming that the reaction in cadaver blood would give the same results as in the blood of the living. It may now be considered established that the serum of cadaver blood behaves in the same way as in life in the fixation of complement.

It was, however, exceedingly difficult to accelerate the Wassermann reaction itself in order to ascertain quickly the suitability of the blood for transfusion. I discussed the matter in conference with all my assistants, and with the leading serologists in Moscow, with the conclusion that with constant readiness and a daily examination of the titre of all the reagents, it would be possible, at best, to complete the reaction in four hours. For a whole 18 months we pondered over this question, but we could find nothing better, and this left the method of little practical use.

THE FIRST TRANSFUSIONS

During this time, however, the need continually arose for urgent transfusions to patients dying from acute hæmorrhages and almost compelled one to use cadaver blood to save their lives, even though it meant foregoing the Wassermann reaction. Of course, to the risk of causing the death of the very first patient by "cadaveric intoxication" there was added the risk of syphilitic infection. It was therefore necessary for the first attempt to have an almost hopeless case to make it worth while. But then there was greater risk that such a patient might die, even in spite of the beneficial effect of the transfusion, after which I would hardly succeed in convincing anyone that the death was not due to "cadaveric intoxication." Such a result would not only check all further attempts at cadaver-blood transfusion for a long time, but it would probably also involve grave consequences to myself both in my profession and at the hands of the legal authorities.

It would thus be preferable to select for the first attempt a case that was not too serious. But such a course was opposed by my conscience as well as by moral considerations.

When on March 23rd, 1930, I was called out to the receiving room and shown a young engineer who had severed the blood-vessels at the elbow in an attempt to commit suicide, I saw that there I had the conditions that I desired. He was dying of acute anæmia, but otherwise he was a strong, robust man. At that same time in the receiving room lay also the corpse of a 60-year-old man who had died six hours previously from a fractured base due to being knocked down by an omnibus. The blood of the old man was of the same group as that of the young engineer. Lastly, my moral responsibility in the event of failure would have been minimal, in that the patient himself had courted death. I ordered the corpse of the old man to be transferred to a laboratory, whither a nurse and assistants were summoned. Having painted the abdomen with iodine, I performed a laparotomy and widely exposed the inferior vena cava. Pumping with a Janet syringe through a hollow needle and a rubber tube I managed to obtain 120–130 c.cm. of blood at once, after which the vein became quite flat, and I had to wait for a fresh accumulation of blood. At the next aspiration only about 50 c.cm. was obtained, and the vein was again empty. To hasten the filling of the vein I had the feet and hands raised and massaged while the chest was rhythmically compressed. Altogether 420 c.cm. of cadaver blood had been collected, when I was told that the would-be suicide was almost at the point of death and that we should have to hurry with the transfusion. We quickly repaired to the operating room, whither the dying man had been transferred. The radial pulse was impalpable, and he was deathly pale and unconscious, with Cheyne-Stokes respiration. I could not feel the pulse in the femoral artery, but it was just palpable in the carotid. The pupils reacted feebly to light. The severed cubital veins were visible in the wound.

The collected blood was held in a Bobrov apparatus with an admixture of 250 c.cm. physiological saline. After the injection of the first 250 c.cm. of blood the radial pulse began to be clearly felt, and after the next 150 c.cm. of blood the patient began to breathe evenly and deeply. Soon consciousness returned, and by the end of the transfusion the patient had a good pulse and his colour had improved. The transfusion itself passed off without giving rise to any general reaction and there were no other complications. Two days later the patient was discharged fully recovered, and with the wound sutured.

This first success exceeded all my expectations, and, fortunately, the autopsy on the body of the old man showed no trace of any lues or any other disease.

A few days afterwards I managed to collect from another body about a litre of blood, which I transfused forthwith to three patients in my clinic—two cancer cases preparing for operation, and a woman with an amputation at the hip for trauma, with sepsis and a non-healing stump. All these transfusions had excellent effects and passed off without complication. Soon afterwards three more transfusions of cadaver blood were made with equal success.

I reported on the experience of my first seven transfusions of cadaver blood to the Fourth Congress of Ukrainian surgeons at Kharkov on Sept. 7th, 1930. I asked the delegates for their formal approval of the work I had begun, since with the support of the congress it would be easier for me to remove any official obstacles to my obtaining fresh bodies. The congress appointed two commissions, legal and military, and both recognised my work as having a scientific foundation and meriting further development. This support enabled me on returning to

Moscow to obtain a special permit from the State attorney's office for collecting blood from fresh cadavers in our hospital before autopsy.

FURTHER EXPERIMENTS

Before renewing the transfusions of cadaver blood I instructed my two assistants, S. I. Barenboim and M. G. Skundina, who repeated Prof. Shamov's experiments on dogs, to supplement them by an accurate study of gaseous exchange using Barcroft's method. Their work was carried out on 49 dogs in which the oxygen content had been carefully measured. The animals were subjected to profuse bleeding and the oxygen content was again estimated. These investigations showed clearly that the great decrease in the oxygen exchange after each exsanguination was followed by a sharp increase after the transfusion of corresponding doses of cadaver blood. It was thus established that fresh cadaver blood acts not only as a suitable colloidal fluid to replenish the loss in the vascular system, but that it can actively participate in one of the major functions of the blood—i.e., the exchange of gases. The erythrocyte of fresh cadaver blood completely regains its rôle as an oxygen carrier. Of this we further convinced ourselves by control experiments, when blood from living animals was transfused instead. It was found that the oxygen content was not increased any more than in similar transfusions with cadaver blood.

Barenboim and Skundina, resuming the study of transfusions in man, also measured the direct gas exchange in a series of patients both before and after transfusion of cadaver blood. And in all these cases the oxygen content and oxygen capacity of the blood were sharply increased after transfusion of cadaver blood.

Thus, not only by excellent clinical results, but also by direct, accurate measurements of the gas exchange, we satisfied ourselves that in transfusing blood from bodies 6–8 hours after death we introduce vital blood, capable of discharging its major functions in the recipient. No toxic phenomena nor any other complications were observed, and in January, 1931, we were able to report our impressions of 50 cases.

TECHNIQUE

By this time some of the technical details were clearly established. It was found that the most convenient method was to take blood from the jugular vein.

The vein is exposed by a small incision between the clavicular heads of the sternomastoid. It is temporarily clamped between two forceps and two strong ligatures are passed near them under the vein. Between them the vein is opened and a wide U-shaped cannula is inserted, the end pointing in a cranial direction. The other end of the cannula is fitted to a rubber tube, the end of which is lowered into a sterile bottle. The body is then placed in the Trendelenburg position, and the blood then begins to flow into the bottle. If the flow ceases a slight readjustment of the cannula in the vein is needed, or it may be enough to turn the head slightly.

Subsequently, when the Moscow Blood Transfusion Institute recommended inserting a long glass cannula through the jugular vein into the right auricle, we added a second cannula, running in the direction of the heart, thus collecting blood in two bottles at the same time.

The quantity of the blood collected varies, depending on a number of conditions, the most important being rigor mortis. It stands to reason also that the corpses of persons dying from injuries, after a considerable loss of blood either externally or into the cavities, will yield less than uninjured bodies, as, for instance, those from angina pectoris or electric shock. Since we gave up using bodies with severely damaged extremities, or with considerable injury to other parts, the selected material yields an average of 900–1500 c.cm. per cadaver in deaths from trauma, while from uninjured cases we usually receive 1·5–2·5 litres, and often 3·5 l. and sometimes even over 4 l. I attempted to obtain larger quantities by exposing the femoral artery as soon as the spontaneous flow of blood had ceased, injecting 1·5–2 l. of physiological saline. This enabled the collection of an additional litre of blood from the jugular vein; although this was diluted, it nevertheless rarely contained less than 45–50 per cent. of hæmoglobin. This washing out of the blood is admissible only under two conditions—if the corpse is uninjured, and if death occurred recently. It was demonstrated by the investigations of Prof. Shamov's assistant, Dr. Kostiukov, that infection of the blood in the mesenteric veins takes place from the intestine approximately 20 hours after death. Although we never withdraw blood later than 6–8 hours after death —generally it is 2–4 hours—if the mesenteric blood should happen to be infected earlier, the washing out with saline would cause the whole of the collected blood to be infected This risk is entirely absent in the free oozing of the blood from the jugular vein.

Interesting experiments have been made by Dr. A. V. Rusakov, pathologist to the institute.

Dissecting cadavers with all the necessary precautions, he injected Indian ink or concentrated methylene-blue into the exposed mesenteric veins. Neither the dye nor the ink was displaced from the point of injection, and no trace of colour was found in the collected blood. Blood from the jugular vein comes only from the upper and lower vena caval system—i.e., from the regions least subject to infection.

Since we have been able lately to obtain large supplies of blood, thanks to the delivery of bodies from all over Moscow organised by the first-aid ambulances, we could afford to ignore the loss of the blood from the portal system. If, however, it is necessary to attempt to make full use of all the resources of each uninjured cadaver corpse—particularly of a universal donor—it would be possible by washing out with saline to collect an additional 1–1·5 l. of 50 per cent. blood. This need has now arisen in connexion with the enormous quantities of blood required in continuous drip transfusions, when we transfuse huge doses at once. But it is best not to subject such diluted blood to long conservation, as owing to its dilution with physiological solution it is after all subject to partial hæmolysis earlier than whole blood.

STORED BLOOD

The possibility of storing cadaver blood solved one of the major aspects of the problem. It not only removed the difficulty of the Wassermann reaction but also allowed time for a most thorough autopsy and for a bacteriological examination of the blood obtained.

For our first transfusions we collected the blood into bottles containing some 4 per cent. sodium citrate solution, periodically adding more as the bottles filled with blood, calculated in the usual proportion. This citrated blood was used either immediately or after a few hours.

Once, after performing a transfusion, I had about half a litre of unused citrate cadaver blood left, and I placed it in a refrigerator in the laboratory. Three days later an elderly patient was brought to me in the clinic with profuse

intestinal hæmorrhage, due to an ulcer. He was in a very grave condition and it was absolutely impossible to operate on him without transfusion of blood. During the night the hæmorrhage was renewed; the patient was obviously succumbing, but no suitable donor could be found. I transfused him with half the cadaver blood that had been kept in the refrigerator for three days. His condition at once improved and I placed him on the operating table. It proved technically to be a difficult case, yet the patient bore up well to a resection of the stomach and part of the duodenum under local anæsthesia. On the operating table I gave him the remainder of the stored blood. The patient fully recovered and got well without any complications.

Since that time we began to store cadaver blood of all groups, keeping it with citrate in a refrigerator. In November, 1932, I reported on my work before the Société nationale de Chirurgie in Paris and was able then to report on 100 transfusions of cadaver blood stored for three weeks and longer—once even it had been kept for 28 days. I have described the details elsewhere (Yudin 1933a).

The problem of blood storage has been studied in a number of research institutions of the U.S.S.R. Prof. Spasokukotsky's clinic, for example, stored blood with an addition of physiological saline. The Central Institute of Hæmatology, directed by Prof. Bagdasarov, has prepared a very successful preserving fluid "IPC," and Prof. Barinstein in Odessa has succeeded in demonstrating that sea-water contains a combination of salts in a very suitable proportion for blood storage.

FIBRINOLYSIS AND ITS ADVANTAGES

After performing over 200 transfusions in my clinic we introduced substantial changes in the technique of blood storage.

My assistant, Dr. Skundina, turned her attention to the remarkable phenomenon that the blood collected for the Wassermann reaction—i.e., without the addition of citrate—remained liquid, unlike the blood of living donors. This prompted her to study this phenomenon more closely in conjunction with our pathologist, Dr. Rusakov. Their joint study of material from over 500 bodies disclosed the following facts. If the blood is obtained from the body of a person that died from a severe disease—e.g., cancer, tuberculosis, or sepsis—or from trauma with prolonged shock, it slowly forms a coagulum that cannot be dissolved, remaining firm until putrefaction. On the other hand, the blood of corpses in cases of sudden death—whether due to severe acute trauma, such as concussion, gunshot wounds, suffocation or electric shock, or to a short attack of angina pectoris or apoplexy—when taken into the test-tube quickly coagulates into an ordinary clot, but very soon, after ½–1½ hours, this dissolves on its own accord and the blood becomes liquid again. This fibrinolysis may be somewhat accelerated by heating or by shaking, while artificial saturation with oxygen retards it.

A whole series of very careful experiments and biochemical analyses carried out by Skundina and Rusakov gave no indications of the possibility of autolysis or disintegration of protein molecules. This is proved first by the fact that in the serum of the fibrinolysed blood the quantity of residual nitrogen is not increased. It was proved furthermore that the fibrinolysis in the blood of those who die suddenly is due to the gradual disappearance of fibrinogen. Ultramicroscopic examinations enabled Dr. Rusakov to carry out direct observations on a very thin reticulum of fibrin; this broke up into particles that do not pass through a filter.

The phenomenon of fibrinolysis in itself is extremely interesting both from the theoretical and practical point of view, but though Skundina and Rusakov in their researches have studied how the process of fibrinolysis occurs, we still do not understand the striking difference between the blood in sudden death and that of living people, while in those dying from severe diseases it behaves exactly as that of living people. The non-coagulation of the blood in sudden death has perhaps an analogy in what we find in hæmorrhages into large cavities, where it usually remains liquid for a long time.

An interesting supplement to these observations has recently been discovered by my assistant, Dr. A. A. Bocharov. He had collected by venepuncture into test-tubes samples of blood from two severe cases of trauma brought to the institute in a state of profound shock. The blood of both showed typical fibrinolysis, remaining liquid. One died in spite of all our efforts, while the other was saved by an operation and by copious transfusions of cadaver blood. On his recovery his blood was observed to coagulate normally. These two cases are so far solitary ones and will have to be supported by considerably more material; but should the discovery be confirmed, it should be very significant, because it indicates that fibrinolysis may set in while the patient is yet alive.

The practical significance of the fibrinolysis of cadaver blood is twofold. First, although we never transfuse blood without a careful preliminary autopsy and a Wassermann reaction, it is an added guarantee against using of blood of diseased people for the purpose of transfusion; for this would coagulate and remain clotted, thus being unsuitable for transfusion. Secondly, the blood does not need any anticoagulant; once dissolved, it remains liquid during any period of storage. Besides merely simplifying the technique, this has another advantage. The addition of any anticoagulant is bound to affect the composition of the blood, for even water is an undesirable ingredient, and our experience has clearly demonstrated the unquestionable advantages of transfusing cadaver blood without any admixtures. Whereas in the first 200 transfusions of cadaver blood with citrate there were about 20 per cent. of moderate reactions in the patients, at present there have been only about 5 per cent. in over 800 transfusions of pure blood.

Clinically, therefore, the indications and the therapeutic effects of cadaver-blood transfusions are the same on the whole as in using the blood of living donors. If a comparison must be drawn with the stored blood of living donors, cadaver blood if used without citrate gives a considerably lower percentage of reactions, and these are less severe.

COMPLICATIONS

Grave complications were encountered several times, but in every case it turned out to be the result of serious errors of technique. We had 5 fatal complications of this kind in the first thousand transfusions of cadaver blood.

In two death followed the classic picture of hæmolysis, and on repeating the determination of the blood groups of donors and recipients they were shown to be incompatible. In another case death was due partly to the fact that the blood transfusion to the patient—operated on for profuss gastric hæmorrhage—was given under avertin narcosie, which made it impossible to control the possible initial reaction. The patient had consented to the operation only on condition that it would be under general narcosis, while it was undesirable to postpone the transfusion after a large gastric resection. In yet another case it was

not possible initially to establish the incompatibility of the groups that proved fatal, but the quality of the blood transfused was verified in an incontestable manner. The same blood from one cadaver had been transfused that morning to another patient, also on account of acute intestinal hæmorrhage. One of them bore the transfusion of half a litre of cadaver blood irreproachably and was successfully operated on; the other developed the signs of acute hæmolysis and died despite prompt decapsulation of both kidneys. Finally, a third patient, a woman with 21 per cent. hæmoglobin who suffered from hæmorrhage due to a uterine fibroid, died from hæmolysis probably on account of reverse agglutination; being of Group A, she had received 1100 c.cm. of cadaver blood of Group O. In two days severe jaundice developed, and although there was no anuria or other sign of serious damage to the kidneys, she died on the fifth day. The autopsy gave no positive data.

Two more deaths directly connected with transfusions may be mentioned; aerial embolism and anaerobic infection at the site of the cubital venesection. Both cases lie as a heavy burden on the statistics of our clinic, but they can hardly be taken as an objection to the use of cadaver blood as such.

To complete the list of serious complications registered in the first thousand of our transfusions, there were two cases of intense jaundice which developed directly after transfusion but passed off harmlessly, with no disturbance of the general condition, temperature, or kidney function. In three other cases there was after transfusion an unusually strong general reaction accompanied by rapidly developing diarrhœa; these effects ceased in the course of a few hours and had no injurious consequences.

RESULTS AND INDICATIONS

All the aforementioned complications are eclipsed by the run of good results usually observed in our transfusions. The effect naturally varies a good deal, depending on the grounds for resorting to the method. We rarely apply and have seen little success in transfusing for systemic diseases of the blood, for septicæmia, or for peritonitis. On the other hand, good results were obtained by transfusion in cancer patients both before, during, and after operation. Here the transfusion of blood has greatly enlarged the scope of surgery by substantially improving the prognosis of operations even in most difficult and dangerous cases.

Acute internal hæmorrhages and grave traumatic shock comprised two other large groups of our cases. The after-effects of internal hæmorrhages are well known, and cadaver blood has rendered us invaluable service in hundreds of extremely grave cases. In a large series of upwards of 3000 cases of extra-uterine pregnancy we readily resorted to reinfusion of the blood collected from the patients themselves; the same applies to cases of ruptured spleen. On the other hand, in profuse gastro-duodenal hæmorrhages the method of cadaver blood transfusion has opened up to us new and extraordinary possibilities. During the last six years upwards of 400 cases of grave intestinal hæmorrhages have gone through my clinic. Over a half were operated on, but all of them received transfusion of cadaver blood in small or large doses. It would be out of place here to dwell on our views and methods in the problem of profuse gastric hæmorrhages, and I have given examples elsewhere (Yudin 1933b); others will be given below.

In combating severe traumatic shock, repeated transfusion of blood in large doses has proved an invaluable remedy. Every surgeon knows how great is the danger to life in a severe shock, and no cardiac stimulants, narcotics, or the most profuse saline infusions can raise the blood pressure or overcome the collapse. By transfusion of large doses of cadaver blood, however, we succeeded in saving a great many of them (Yudin 1933c, 1936).

The three great problems, therefore, of cancer surgery, profuse gastric hæmorrhages, and shock, have assumed a new aspect since, benefiting by the ideas and researches of Marriott and Keckwick (1935), we began to apply the continuous-drip method that enabled us to inject enormous doses of blood. So far our personal experience is not large enough to warrant any final conclusions, but our results in the first twenty large continuous-drip transfusions justify us in building up great hopes.

ILLUSTRATIVE CASES

The following are a few examples of the two main groups of patients—cancer and profuse hæmorrhage.

CASE 1.—Woman, aged 50, operated on by Dr. M. S. Alexandrov, gynæcologist to the institute, on July 25th, 1936, on account of ovarian adenocarcinoma. Under spinal anæsthesia, a tumour was removed the size of an adult head. An examination of the stomach revealed a carcinoma of the antrum (pathologically confirmed as belonging to the Kruckenberg type). The patient was very weak and had only 29 per cent. hæmoglobin. The post-operative course was without complications, but when she was brought to my clinic a fortnight later the hæmoglobin had dropped to 21 per cent.; red cells to 2,320,000.

Her blood belonged to Group B. A continuous-drip transfusion of 500 c.cm. of cadaver blood produced a slight chill with thrombosis of the cubital vein. Three days later a fresh transfusion was begun on the other arm and in the course of 30 hours another 2200 c.cm. of blood of Group B collected from seven different cadavers was injected, and there was no reaction whatever. The hæmoglobin rose to 62 per cent., red cells to 4,660,000. Her general condition was excellent and under local anæsthesia on August 20th I performed an extensive resection of the Polya-Finsterer type. Dr. Alexandrov, who was present during the operation, scarcely recognised his patient, so well did she look after the transfusion. The post-operative course was perfectly smooth and I allowed her to walk on the third day. On Sept. 5th she went home in splendid condition.

CASE 2.—Woman, aged 43, with a large cancer of stomach. Very pale, cachectic. Hæmoglobin 42 per cent., erythrocytes 2,930,000, leucocytes 7800, differential count normal; Group B.

Before operating I injected her with 4100 c.cm. of cadaver blood for 50 hours by the continuous-drip method, at first with 400 c.cm. of Group AB stored for 7 days; next with 800 c.cm. of Group B stored for 5 days; then again 800 c.cm. of Group AB and 5 days storing in the quantity, and finally 2100 c.cm. of Group AB again. After transfusion of the first 200 c.cm. there was a rigor and vomiting which quickly subsided; the remaining quantity she accepted almost without reaction. A local reaction along the vein to the armpit region remained for two days after transfusion, as also did a slight jaundice of the sclera. Urine was normal.

The hæmoglobin rose to 85 per cent.; erythrocytes up to 5,120,000; leucocytes to 8400, with a normal differential count. General condition improved beyond recognition, and I placed her on the operating table in quite a good state. Unfortunately, the tumour proved to be quite inoperable. After 22 days she left the clinic with hæmoglobin 69 per cent., erythrocytes 4,830,000, and leucocytes 7500.

CASE 3.—I was approached by a woman physician of my acquaintance for advice about her husband who had been treated during two years for severe colitis due to amœbic dysentery. In spite of treatment in several hospitals his health was growing steadily worse and I found him extremely cachetic, with his hæmoglobin only 11 per cent. Without going into the question of diagnosis and therapy I at once suggested blood transfusion. The wife

was aware of my method of cadaver-blood transfusion and she requested me to use living donors. I asked her to purchase and deliver to me citrated blood from the Moscow Institute of Hematology, and she brought 400 c.cm. of blood, which raised the hæmoglobin to 19 per cent. I asked for more and she brought another 500 c.cm. and it rose then to 29 per cent. By that time my original diagnosis of cancer of the splenic flexure of the large intestine was confirmed by X rays and I decided that I would operate only if by means of further large transfusions I could substantially raise the hæmoglobin and improve his general condition—it was a question of an additional 2–3 l. of blood. The patient and his wife in view of the tremendous expense involved finally had to give in and consent to the use of cadaver blood. By the drip method I injected 2100 c.cm. of cadaver blood of Group O, and the hæmoglobin rose to 76 per cent. I operated on him in splendid condition under spinal anæsthesia—a right hemicolectomy. He had a smooth recovery, and when I saw him five months later he was flourishing.

CASE 4.—Cachectic old man aged 66. Cancer of stomach occupying two-thirds of antral part. Operating under local anæsthesia I managed with difficulty to separate the tumour from the pancreas, and in mobilising the duodenum I discovered an abscess formed by the disintegration of cancerous glands. The cavity of the abscess was embedded in the mesocolon, its base was formed by the pancreas, and the upper edge of the abscess lay close to the concave part of the duodenum. On mobilising, the latter burst and with great difficulty I sutured the stump and performed a subtotal gastrectomy (Polya-Finsterer) and a thick rubber drain was inserted in the cavity of the abscess.

I must confess that the operation left on me a very painful impression, as not only did I not expect any lasting recovery, but I believed that the case was bound to end in peritonitis. Also the danger of operating shock was very serious. Without any great hopes, therefore, I ordered forthwith a blood transfusion of 700 c.cm. of the corresponding Group O of 4 days' storage; this was injected at once on the operating table. Next were injected by the continuous-drip method from three cadavers of Group O, in succession, 1700 c.cm., 1600 c.cm., and 1350 c.cm. during 50 hours 20 minutes; all the three samples had been stored for 4 days. Altogether 5350 c.cm. of cadaver blood were transfused. An hour after the beginning of transfusion there was a slight rigor and a temperature of 101° F. Subsequently no reactions and no complications. Hæmoglobin rose from 54 per cent. to 80 per cent., erythrocytes from 3,460,000 to 5,190,000. Smooth post-operation course. Suppuration ceased in about ten days. Discharged three weeks after operation in good health. Examined after four months and found in splendid condition.

PROFUSE GASTRIC HÆMORRHAGES

CASE 5.—Engineer, aged 30 years, with symptoms of dyspepsia for four years. On Nov. 18th usual pains sharply increased, and on Nov. 20th he had a fainting attack. Nov. 21st, melæna; Nov. 22nd, in the night, vomited blood and was brought to the clinic. The hæmoglobin was 64 per cent. Refused to be operated. Hæmatemesis not renewed, but hæmoglobin continued to drop, and was 57 per cent. on Nov. 27th with erythrocytes 3,770,000. Patient himself then asked to be operated on. A hæmostatic transfusion of 250 c.cm. of cadaver blood of Group A was made on the evening of Nov. 28th and I operated in the morning. Duodenal ulcer resected (Finsterer). Immediately another transfusion was given of the same cadaver blood—1 l. during half an hour, and then another 1950 c.cm. of same blood by the drip method for 13 hours. Altogether 3200 c.cm. of cadaver blood were transfused. Hæmoglobin rose to 67 per cent., erythrocytes to 4,030,000. Smooth post-operative course.

CASE 6.—Engineer aged 28 years. Duodenal ulcer since 1929. Gastro-enterostomy in 1930 in a Moscow hospital, since when he had felt well until, early in November, 1936, there were renewed pains in epigastrium. Nov. 23rd, sudden giddiness and fainting. Nov. 24th, hæmatemesis; brought to the institute. Pale, pulse feeble, hæmoglobin 64 per cent., erythrocytes 4,210,000, leucocytes 8400; Group AB.

I operated on him at once under local anæsthesia. Healed duodenal ulcer, and large active ulcer in anastomotic loop, penetrating into the mesocolon. The operation proved difficult owing to numerous adhesions. Resection of stomach and anastomosis; intestine sutured end-to-end; stump of duodenum sutured, with junction of Polya-Finsterer type. Patient by the end of operation was in a state of considerable collapse. Prompt transfusion of blood. By drip method 2 l. of cadaver blood of Group AB of 9 days' storage and 900 c.cm. of cadaver blood of Group B of 20 days' storage were injected. Patient rapidly improved. No immediate reaction. On the second day, however, jaundice appeared which increased on the third day; but neither subjectively nor objectively did this hinder recovery. On Nov. 26th hæmoglobin rose to 75 per cent., erythrocytes to 4,340,000, leucocytes to 18,000.

CASE 7.—Woman, aged 24, was suffering already 7 years from gastric ulcer repeatedly demonstrated by X rays. Last week pains sharply increased, and during the last two days tarry stool. Admitted with hæmatemesis, extremely pale, and in a state of collapse. Hæmoglobin 47 per cent., erythrocytes 2,810,000, leucocytes 6000; Group A. We had four stocks of blood from different Group A cadavers of 12, 14, 15, and 19 days' conservation, altogether about 2 l. (1950 c.cm.). This enabled me to venture on an immediate operation under local anæsthesia. Duodenal ulcer penetrated with one edge into the pancreas and with the major part into the hepato-duodenal ligament of the lesser omentum. It was a difficult resection; the bottom of the detached ulcer had to be stripped off directly under the pulsating hepatic artery. The sutured stump of the duodenum had then to be invaginated and sewn by infiltrated œdematous ligaments to the capsule of the pancreas. Prompt transfusion was given of 1 l. rapidly, lasting an hour without reaction; a second litre until evening, lasting 8 hours. Hæmoglobin rose to 61 per cent., erythrocytes 3,980,000, leucocytes 10,000. Yet, in spite of the smooth post-operative course the hæmoglobin soon dropped again and on the sixth day after the operation it fell to 40 per cent. By that time we had fresh supplies of cadaver blood. On Dec. 31st and on New Year's Day we transfused by the drip method 1250 c.cm. of Group A, 1750 c.cm. of Group O, and again 1250 c.cm. of Group A almost without any reaction. Thus during the 24 hours she received 4200 c.cm. of cadaver blood, and with the amount transfused immediately after the operation it made a total of 6200 c.cm. of cadaver blood. Even on the night of Dec. 31st the hæmoglobin had risen to 79 per cent. and erythrocytes to 4,550,000. On Jan. 1st the figures were: hæmoglobin 81 per cent., red cells 4,630,000. On Jan. 3rd: 86 per cent. and 5,380,000 respectively. She was discharged in a flourishing condition.

CASE 8.—On the morning of Nov. 26th, 1936, a man was brought to me in a very grave condition: though aged 43 years he looked a man of 60, with a deathly pallor. Hæmoglobin 18 per cent., erythrocytes 1,010,000, leucocytes 11,500. He had had hæmatemesis and tarry stools for the last 11 days. Severe pulmonary emphysema and acute bronchitis with large quantities of sputum. Appreciable puffiness of the face and considerable œdema of the legs. His condition was almost hopeless. It would have been a desperate course to operate with the usual resources, the more so since the possibility of meeting with carcinoma had not been excluded. His blood was Group O. On checking up my stocks I found 1350 c.cm. of cadaver blood of 22 days' storage, and yet another 1·5 l. of freshly collected blood that had not had the Wassermann reaction.

Under local anæsthesia I opened the abdomen and I saw indeed the presence of a big antral carcinoma. Subtotal Finsterer gastrectomy. 1350 c.cm. of blood injected by the drip method during the day. In the evening there was no more blood left, and although the patient's condition was sharply improved, while the hæmoglobin rose to 33 per cent. and erythrocytes to 2,150,000, I ordered not to withdraw the cannula from the vein and to continue injecting the physiological solution, in order to counteract dehydration. On the following morning the hæmoglobin was 46 per cent., abdomen soft, pulse splendid, but the

patient was choking from a cough and expectorating a mass of green sputum. Disregarding expostulations of my assistants, I continued the saline injection, and during the day he received intravenously another 3 l. The cough was now desperate. That night a negative result to the Wassermann reaction was reported and I ordered prompt transfusion of the other blood. During the night 1500 c.cm. were transfused, and in the morning the patient was unrecognisable: he was pink, "feeling fine," with a new appetite. The abdomen was soft; hæmoglobin 53 per cent., erythrocytes 2,980,000, leucocytes 8600. Cough rapidly diminishing. He had a smooth recovery, and the wound healed by first intention.

COMMENTS

In a brief report it is impossible to describe the whole hopelessness of the condition of the last patient. If my personal experience of considerably over 3000 gastric operations—including several hundred for cancer and over 200 for profuse hæmorrhage—entitles me to make a prognosis in individual cases, I must say that there was almost no chance of saving him. Only the copious blood transfusion saved his life and made it possible to risk an operation on him. The whole of our latest experience of large transfusions leaves the same impression.

I am far from seeing in surgical treatment the whole solution to the problem of cancer. Nevertheless, since to-day there is no better method of treatment, our duty is to extend its field of application and reduce the percentage of operative mortality. I am convinced that in this the method of *large* transfusions will open a new era.

Similarly in the surgical treatment of acute gastro-duodenal hæmorrhages large transfusions—of not less than 3–4 l.—afford unprecedented possibilities. In the conservative treatment of acute hæmorrhage we lost about 22 per cent. of our patients. In emergency operations the rate of mortality was nearly the same—15 per cent., to be exact. In our last series with large transfusions there has not been a single death so far, even in desperate cases. Further experience will show how far our optimism may go. I repeat, important is not only the fact that the saving of some of our exsanguinated patients was nothing short of a miracle, but that also in all the other cases of profuse hæmorrhages without exception a few litres of transfused cadaver blood improved at once the general condition, while the post-operation appearance of such patients was almost unrecognisable.

To be sure, in combating the most severe forms of traumatic shock our early transfusions did not advance far beyond what Marriott and Kekwick termed "homœopathy." I have already mentioned that in the more desperate cases of traumatic shock the transfusion of cadaver blood often gave us very good results. It was just in these cases that the largest doses were given by us—800–900 c.cm. two or three times in succession. I am inclined to think that the first transfusion even in the case of shock should not be less than a litre, after which the transfusion should be continued by the drip method for one or two days and even longer.

There is no doubt that the giving of the largest transfusions will have certain definite clinical indications, while for the majority of the remaining cases the previous small transfusions—i.e., 500–750 c.cm.—will prove sufficient.

Undoubtedly the method of Marriott and Kekwick was a great achievement. But in using the blood of living donors it would be exceedingly difficult to find so large a number of people of whom every one individually can give only a small quantity of blood. Furthermore, the use of living donors in the drip method requires inevitably the addition of anticoagulant, and the dose of the latter in large transfusions would prove very great, 20 grammes and more. This should hardly be without effect on the recipient. In this respect our method of cadaver blood transfusion has an advantage, for the cadaver blood is stored and introduced without any anticoagulants. It can be prepared in large quantities and kept in stocks sufficient for large doses and emergency day or night transfusions.

In conclusion, I repeat that in well over 1000 cases of our transfusions the efficacy of cadaver blood has already been sufficiently proved. The cases I have described of highly successful cadaver-blood transfusions in very large doses with the best success are proof positive that even after lengthy storage this blood is free from toxic properties.

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THE ARTERIAL PULSE IN HEALTH AND DISEASE *

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PHYSICIAN TO THE MANCHESTER ROYAL INFIRMARY

(*Concluded from p. 305*)

The Korotkow Sounds

In 1905 Korotkow published his classical observations on the arterial sounds. These gave us a clinical method of estimating the diastolic blood pressure. He showed that the sounds heard during decompression of the arm are divisible into four groups. Fig. 27 is a record of the Korotkow sounds taken with an electrical stethoscope. In the diagram I have represented the amplitude of the maximal vibration in these eleven records. When the pulse-wave first succeeds in penetrating the armlet, a series of dull thuds is heard. These are the "first phase" Korotkow sounds. They are succeeded in the "second phase" by sounds which are blurred and have more the character of a murmur. These in turn are followed by the clear loud "third phase" sounds which increase in intensity as decompression proceeds, but later diminish at first gradually and then abruptly. The abrupt diminution in intensity marks the transition from the third to the "fourth phase," and is taken as the diastolic endpoint (see Fig. 27). The sounds of the "fourth phase" differ from those of the third not only in intensity but also in quality. Instead of being clear and sharp, they are dull and muffled. The "fourth phase" is usually a short one, and, with a further fall in pressure of only a few millimetres, the sounds attain their lower limit of audibility, and silence rules throughout the remainder of decompression.

SOUNDS PRODUCED BY WAVES IN CLOSED TUBES

Before considering the mechanism whereby deflation of the armlet gives rise to the changes in the Korotkow sounds which I have just described, I must refer to some experimental observations. These were made

* The Lumleian lectures delivered at the Royal College of Physicians on March 9th and 11th, 1937.

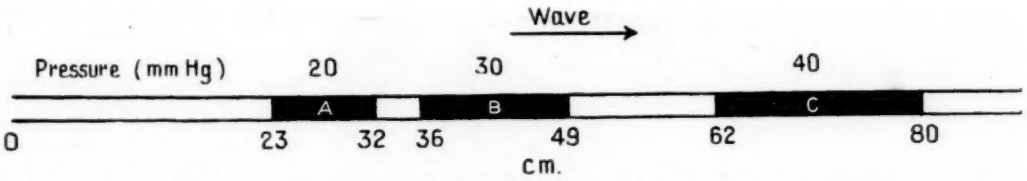

FIG. 28.—Diagram illustrating position of "disturbed area" at pressures of 20 (A), 30 (B), and 40 (C) mm. Hg. Lower figures indicate distance in cm. from proximal end of tube.

on an artificial schema of the circulation similar to that which I used for studying the change in form of the pulse-wave during transmission.

Erlanger showed that a wave, in passing along a rubber tube filled with water, gives rise to the production of sound; and further, that the sound produced exhibits striking variations, both in quality and in intensity at different points along the course of the tube. The change in quality of the sounds, as heard with a stethoscope, enables one to map out three regions in the tube.

1. In the proximal region only a dull thud is heard. This becomes louder as one passes farther down the tube.
2. In the intermediate region the sound is very loud. Here it is no longer dull in quality, but sharp and snapping.
3. In the distal region the sound is duplicated. Here it tends to lose its snapping character, and becomes fainter and fainter as one approaches the far end of the tube.

Erlanger pointed out that, in the region where the loud snapping sounds are heard, the wall of the tube is subject to a very severe shock. This he demonstrated by sprinkling sand on the upper surface of the tube. With the passage of a wave, the sand is violently thrown off in that region of the tube where the shock is most severe and where the loud snapping sound is heard on auscultation. In other parts of the tube the sand lies undisturbed. The scattering of sand is most violent when the initial pressure in the tube is low. At higher pressures it is less complete. Similarly, at the higher pressures, the sounds heard on auscultation are fainter and less snapping in character.

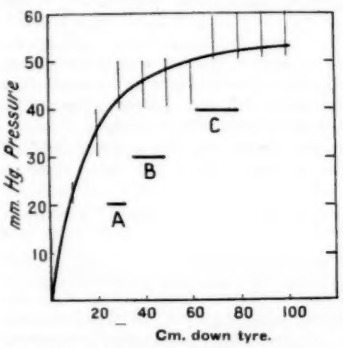

FIG. 29.—Diagram showing relation of "disturbed areas" (in Fig. 28) to threshold of pre-anacrotic phenomenon.

While working in Erlanger's laboratory I made some further observations on this phenomenon. I found that the position of the "disturbed area"—i.e., the area in which the sand is thrown off the tube—varies with the pressure of the fluid in the tube. As one raises the pressure the disturbed area recedes from the proximal towards the distal end of the tube; while, at high pressures, the wave passes down the tube and back again without producing sufficient disturbance to throw off the sand. In other words, the higher the initial—i.e., the diastolic—pressure in the tube, the farther has the wave to travel before it produces a turbulent condition in the artery.

In Fig. 28 I have represented diagrammatically the results obtained in a series of experiments.

When the initial pressure in the tube was 20 mm. the sand was thrown off from the segment marked A near the proximal end of the tube. When the initial pressure was 30 mm. the disturbed area (B) was situated farther down the tube. When the pressure was 40 mm. the disturbed area (C) was situated in the distal part of the tube. Finally, when the initial pressure was 50 mm. the sand remained undisturbed throughout the whole length of the tube.

In Fig. 29 I have plotted the disturbed area at these three different pressures in relation to the curve of development of the pre-anacrotic waves. It is apparent that the two phenomena are closely related.

When the initial pressure in the tube is low, in addition to the disturbed area (A in Fig. 28) to which I have referred, the sand is thrown off from another region (A2) farther down the tube. In the intervening region between these two disturbed areas the sand remains in situ.

If now one studies the form of the sphygmogram at different points along the course of the tube (Fig. 30) it is apparent that these two disturbed areas coincide with the regions where the wave front becomes unstable and where daughter waves are given off.

In the more distal part of the tube the daughter wave and the main pulse-wave

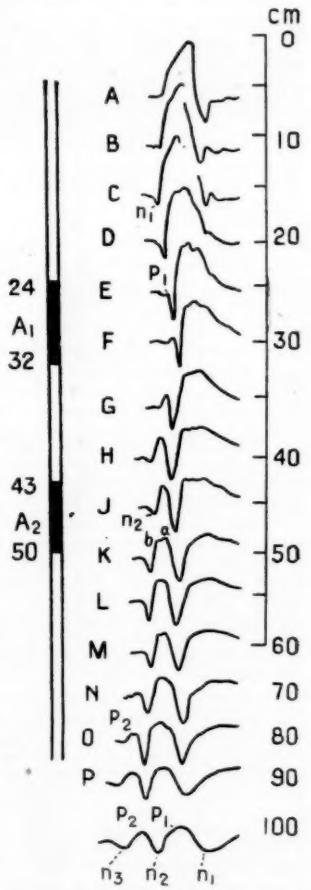

FIG. 30.—Diagram showing relation of "disturbed areas" to form of sphygmogram.

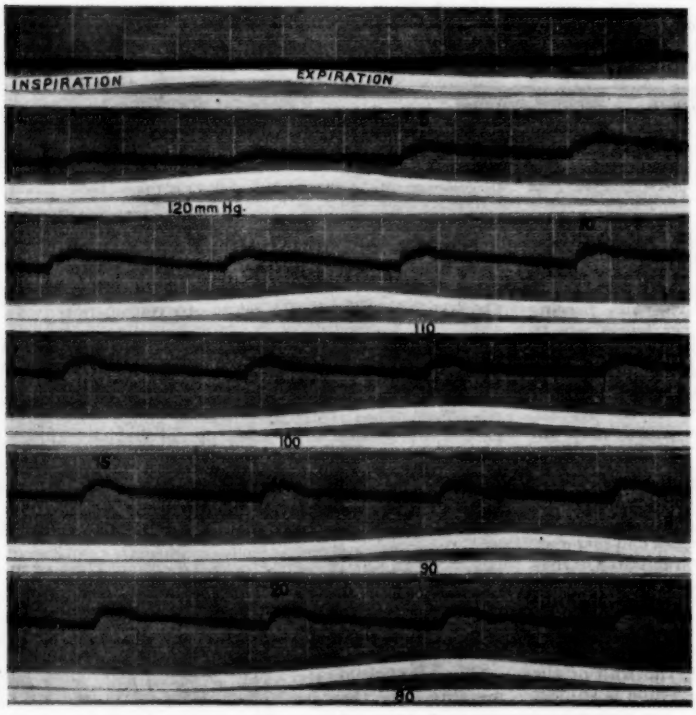

FIG. 31.—Typical record. The numerals on the lower signal indicate compressing pressure.

are of equal amplitude. This accounts for the fact that, in this region of the tube, Erlanger noted duplication of the sound. I would, however, particularly call your attention to the fact that here the sounds had lost their sharp and cracking character.

Before proceeding to consider the mode of production of the third phase Korotkow sounds in man, I will summarise the evidence relating sound production to the formation of "breakers" in rubber tubes.

1. When a pulse-wave passes down a rubber tube filled with fluid, on the upper surface of which sand has been evenly scattered, the sand is thrown off in certain places, while in other parts of the tube it remains undisturbed.

2. If one listens with the stethoscope to the sound produced by the passage of the wave, one finds that in those regions of the tube where the sand was thrown off the sounds are sharp and cracking, while in all other parts of the tube they are dull.

3. If the form of the pulse-wave be recorded graphically at different points along the tube, it is found that, within the disturbed area where the sharp sounds are heard, the wave front has reached a stage of development which renders it unstable and leads to the formation of "breakers."

4. The distance from the proximal end of the tube at which the disturbed area is situated, the sharp cracking sounds are heard, and "breakers" develop varies with the initial (diastolic) pressure of the fluid in the tube. When the initial pressure in the tube is high, none of these phenomena develop.

These observations compel one to conclude that the sharp snapping sounds heard in the disturbed areas of the tube are produced by the vibrations set up by sudden oscillations of pressure associated with the development of "breakers."

THE SPHYGMOGRAM DURING DECOMPRESSION

Having considered the conditions governing the production of sound in the artificial schema, I will now refer to some analogous experimental observations in man (Bramwell and Hickson 1926). The object of these experiments was to ascertain what change in form the pulse-wave underwent in passing through the segment of the brachial artery compressed by the armlet of the sphygmomanometer and to see whether this change could be correlated with the change in the Korotkow sounds during deflation of the armlet. The procedure was similar to that used in the estimation of blood pressure by the auscultatory method, but instead of listening with a stethoscope we took a record of the pulse immediately below the armlet.

A Riva Rocci armlet was applied to the upper arm, and the pressure raised sufficiently to abolish the pulse in the artery distal to the armlet. The air in the armlet was then allowed to leak away gradually; and, throughout the period of deflation, a continuous sphygmographic record was taken from the brachial artery immediately below the armlet, every 10 mm. fall of pressure in the armlet being signalled on the record.

Fig. 31 is a typical record from a normal subject while the pressure in the armlet fell from 130 to 80 mm. Hg.

The features to which I wish to draw attention are:—

1. The gradually increasing amplitude of the first few pulse-waves which succeed in penetrating the compressed segment.

2. The form of the sphygmogram: (*a*) at high pressures it is anacrotic; (*b*) at intermediate pressures it exhibits a horizontal plateau; and (*c*) at low pressures it is catacrotic.

3. Lastly let me direct attention to the pre-anacrotic and anacrotic vibrations. These are present only in the first 18 cycles of this record. Then they suddenly disappear, and in the remaining 4 cycles the sphygmogram conforms to the ordinary physiological type. The diastolic pressure in this case was 95 mm. Hg. The sudden diminution in amplitude preceding the disappearance of pre-anacrotic wave occurs at a stage of decompression in the immediate neighbourhood of the transition from third to fourth phase Korotkow sounds.

We have made observations on patients with high and with low blood pressures, as well as on normal subjects. A few examples of these are given in Table III.

In all cases the compressing pressure at which the pre-anacrotic waves finally disappeared was slightly below that at which the loud snapping third phase Korotkow sounds gave place to the fainter and duller fourth phase sounds. The point at which the pre-anacrotic waves disappear is remarkably constant in different records taken from the same

subject (Fig. 32). The diminution in amplitude and subsequent disappearance of the pre-anacrotic wave is very clearly shown in the lower two records.

These pre-anacrotic waves, in the human sphygmogram, bear a striking resemblance to those that we recorded in the artificial schema (Figs. 21 and 22). They are also very similar to those that Erlanger observed in the dog. In his experiments, during the earlier stages of decompression, a negative wave was constantly present in front of the main upstroke of the sphygmogram. He showed, further, that the range of pressures in which the pre-anacrotic negative wave disappeared coincided closely with the transition from third to fourth phase sounds.

By a slight modification of technique, instead of recording the sphygmogram, one can record the Korotkow sounds.

If an open side tube be interposed between the receiver and the recording capsule (Fig. 33) the slower pressure changes are eliminated, and only the more rapid sound vibrations are recorded. This is shown in Fig. 34, in which the three records were made with a wide, a medium, and a small aperture respectively. In the record with a small aperture, pulse form is recorded; in that with a wide aperture, only sound vibrations. The middle record is intermediate in type between the other two. The open side tube also enables one to use a much more sensitive recording membrane.

TABLE III

Sphygmograms during Decompression at Different Pressures

Heart-rate.	Blood pressure.	Negative wave lost at*	Clinical condition.
67	135/95	90 +	Normal.
74	135/75	70	Diabetes.
82	115/45	40 −	Pernicious anæmia.
77	245/125	120	Chronic nephritis.

* The signs + and − indicate that the disappearance of the negative wave did not coincide exactly with one of the pressure signals but occurred at a decompressing pressure slightly higher or slightly lower respectively.

We (Bramwell and Hickson 1926) have obtained optical phono-arteriograms from a number of different subjects both normal and pathological, and these all present certain features in common.

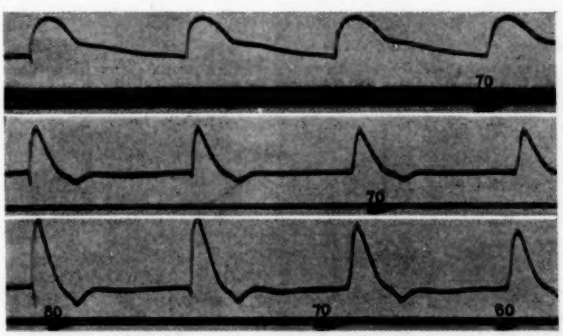

FIG. 32.—Three records taken from the same subject, in whom the transition from third to fourth phase sounds occurred at a compressing pressure of 70 mm. Hg. In the lower two records there was a small perforation in the membrane of the Frank's capsule. This accentuates the amplitude of the deflections. Numerals indicate compressing pressures.

The most conspicuous feature in all records is a series of large deflexions which increase in amplitude during the early stage of deflation and then become smaller as decompression proceeds. In normal subjects (Fig. 35) these large deflexions disappear

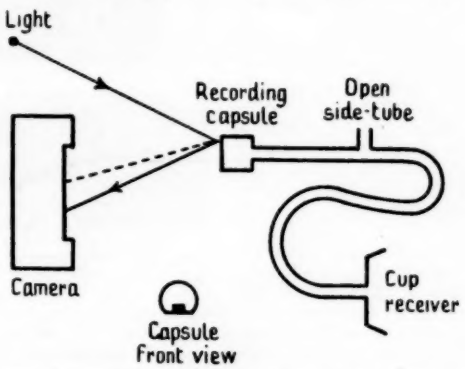

FIG. 33.—Diagram showing recording apparatus, with open side tube.

when the compressing pressure is slightly below diastolic, but in patients with free aortic regurgitation (Fig. 36) they persist throughout the whole record. The disappearance of the large deflexions coincides with the disappearance of the fourth phase Korotkow sounds. In normal subjects the fourth phase sounds die away when the compressing pressure is only a few millimetres below diastolic, but in patients with a water-hammer pulse they may persist throughout the whole period of decompression. The amplitude of these large deflexions varies with the steepness of the front of the pulse-wave in the compressed segment under the armlet.

In these records the large deflexions are preceded by one or more small deflexions of a higher frequency. The latter are only present during the earlier stages of decompression. They attain their greatest amplitude just before, and die away suddenly just after, the compressing pressure is equal to diastolic.

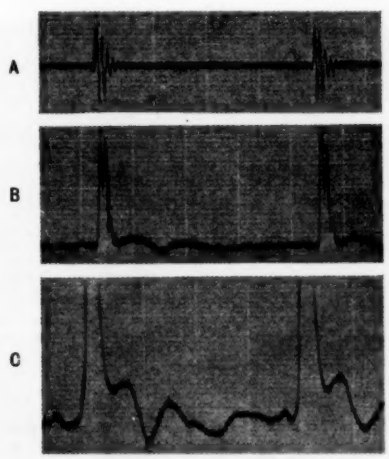

FIG. 34.—Three phono-arteriograms from same subject. A, side tube open. B, side tube partially closed. C, side tube closed almost completely.

They correspond both in form and in incidence to the pre-anacrotic vibrations in the sphygmogram, and to the pre-anacrotic waves in the artificial schema.

In Fig. 36 I have placed side by side sphygmograms and phono-arteriograms taken at corresponding pressures from a patient with free aortic regurgitation. You will see that the pre-anacrotic waves in the former, and the initial small vibrations in the latter, exhibit a very striking similarity to one another. When the pressure in the armlet is 60 mm. both positive and negative pre-anacrotic waves are present. At 30 mm. the pre-anacrotic dip is only just discernible and at 0 mm. there are no pre-anacrotic waves.

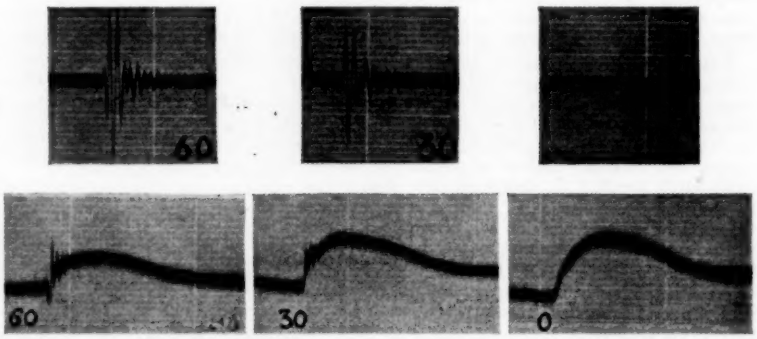

FIG. 36.—Comparison of phono-arteriograms (above) and sphygmograms at corresponding pressures (in figures): from a patient with free aortic regurgitation.

The fact that the pre-anacrotic vibrations in the sphygmogram and the rapid initial deflexions in the phono-arteriogram disappear at the same stage of decompression as that at which the sharp third phase sounds give place to the dull sounds of the fourth phase, suggests that their presence is responsible for the sharp cracking quality which characterises the third phase Korotkow sounds. The large vibrations being of a relatively low frequency yield a dull low-pitched sound, while the higher frequency of the pre-anacrotic vibrations gives a higher pitched and sharper crack. Thus we have established a complete analogy between the phenomena which we observed in the artificial schema and the clinical observations in man.

This part of the subject may be summarised by the statement that the evidence derived from the phono-arteriograms suggests that the intensity of the Korotkow sounds depends on the steepness of the front of the pulse-wave, and the peculiar snapping quality of the third phase sounds on the presence of arterial "breakers."

BLOOD-PRESSURE ESTIMATION IN AORTIC VALVULAR DISEASE

The hypothesis which I have put forward helps to explain the difficulty which one sometimes experiences in estimating the diastolic blood pressure in cases of aortic valvular disease.

In patients with a water-hammer pulse, loud sharp sounds resembling the normal third phase Korotkow sounds may be audible throughout the entire later part of decompression; and this is not surprising, for the wave front is sufficiently steep to set the arterial walls into vibration even when the compressing pressure has fallen to zero, while the presence of *anacrotic* "breakers" gives a sharp snapping character to the sounds. It is, however, usually possible by careful auscultation to detect in the course of decompression an alteration in the quality of the sounds. This is the point at which the *pre-anacrotic* waves disappear and only anacrotic "breakers" remain. It is the true diastolic end-point.

Conversely, in patients with aortic stenosis it is often not only difficult but impossible to obtain a diastolic reading. The pressure gradient of the anacrotic pulse is so gradual that, even after passing through the compressed segment of the artery, no breakers are formed. The whole range of the Korotkow sounds in such cases may not extend over more than 10 or 20 mm. and the true diastolic pressure lies somewhere below the point at which the Korotkow sounds die away.

In this respect the anacrotic pulse of aortic stenosis differs from the anacrotic pulse of hyperpiesis. In the latter, the pulse pressure is very high and consequently, when the compressing pressure is in the neighbourhood of diastolic, the pressure gradient under the armlet becomes very steep and "breakers" are formed.

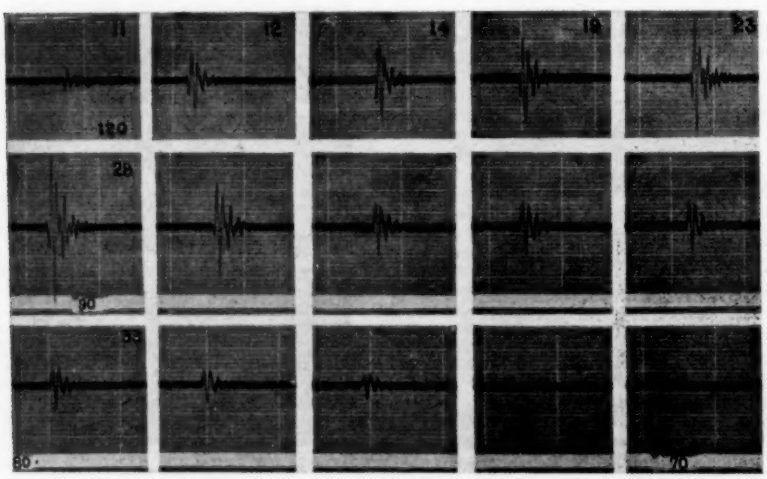

FIG. 35.—Selected cycles from continuous phono-arteriogram obtained from normal subject during decompression. Compressing pressure (lower numerals) signalled every 10 mm.

PITCH OF KOROTKOW SOUNDS

In the past, the Korotkow sounds have been employed exclusively for the estimation of blood pressure; but, on listening to them, one cannot fail to be struck by the great range of variation, both in the intensity and in the pitch of the sounds in different subjects.

The volume of the Korotkow sounds varies with the amplitude of vibration of the arterial wall. This is determined chiefly by the steepness of the pressure gradient along the front of the pulse-wave. In cases of aortic incompetence for example the sounds are very loud, while in aortic stenosis they are very faint.

The pitch of the sounds depends on the elasticity of the arterial wall, and may therefore be capable of yielding information regarding the functional efficiency of the artery.

When the wall of an artery is set into vibration by the sudden rise in pressure accompanying the arrival of the pulse-wave, it tends to oscillate in its own natural period. The frequency of oscillation is determined by its extensibility. This, as I have already pointed out, depends partly on its structural condition and partly on the diastolic tension. Thus in an arterio-sclerotic vessel, other things being equal, the vibrations are more rapid and the Korotkow sounds are higher pitched than in a healthy artery.

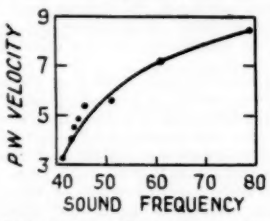

FIG. 37. — Relation of pulse-wave velocity and sound frequency in eight subjects (Braithwaite 1930).

In this respect the arterial sounds are comparable to the heart sounds. A high-pitched second heart sound, in the aortic area, may be due either to atherosclerosis or to high blood pressure. The former renders the aorta structurally inextensible; the latter produces a similar functional result in an otherwise healthy vessel.

Some preliminary observations on this problem were made by Braithwaite (1930). In a series of 8 subjects he determined the frequency of the large vibrations in graphic records of the Korotkow sounds. He also measured the velocity of transmission of the pulse-wave. The result of these observations is represented graphically in Fig. 37. It shows a close correlation between pulse-wave velocity and sound frequency. This suggests that the two phenomena are dependent on a common factor—namely, the extensibility of the arterial wall.

These observations were only of a preliminary character, but the results obtained were definite enough to suggest that it would be worth while to pursue the inquiry further.

Summary

The experiments which I have described show that waves in fluid, contained in elastic tubes, may undergo a change in form in the course of transmission. Under certain clearly defined conditions, part of the wave front tends to become steeper, and eventually unstable. This gives rise to a turbulent motion of the fluid in the tube, comparable to the formation of breakers in a wave on the seashore.

Similar physical phenomena may occur within the arteries of the living body. In patients with free aortic regurgitation, for example, the pressure conditions are such that part of the front of the pulse-wave is likely to become unstable before reaching the periphery. This probably accounts, in part at least, for the distinctive features of the "water-hammer" pulse.

Observations on an artificial schema of the circulation, and graphic records of the Korotkow sounds, in man, show that the change in the arterial sounds which accompanies deflation of the armlet, is determined by the change in form of the pulse-wave as it passes through the compressed segment of the brachial artery. These experiments suggest that the intensity of the Korotkow sounds varies with the steepness of the wave front, that the distinctive cracking character of the third phase sounds is due to the development of "breakers" in the pulse-wave, and that the pitch of the sounds depends on the extensibility of the arterial wall.

Conclusion

The problems which I have been considering in this lecture are essentially academic; but I hope that they may have proved to be of some interest in view of their bearing on clinical phenomena with which we are constantly confronted in the practice of medicine.

I am indebted to Messrs. Arnold and Co., to the Macmillan Company, and to the publishers of the *Quarterly Journal of Medicine* and *Heart* for permission to reproduce figures which have previously appeared in my original papers published by them, also to Dr. Graham Steell for Fig. 14.

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HARLOW WOOD ORTHOPÆDIC HOSPITAL.—The new extensions to this hospital were opened on July 28th by Mr. R. H. Bernays, parliamentary secretary to the Ministry of Health. The extensions consist of a new ward block and additions to the nurses' home and the administration block.

PERMANENT EXPERIMENTAL DIABETES PRODUCED BY PITUITARY (ANTERIOR LOBE) INJECTIONS

BY F. G. YOUNG, Ph.D.

(From the National Institute for Medical Research, London, N.W.)

THE demonstration that hypophysectomy alleviates the symptoms of pancreatic diabetes (Houssay and Biasotti 1931) implied that pituitary extracts might possess diabetogenic activity. That the administration of anterior pituitary extracts may lead to the transitory appearance of the symptoms of *diabetes mellitus* has been claimed by a number of investigators, though others have failed to confirm these findings. The results of experiments confirming the diabetogenic activity of fresh ox anterior lobe were briefly reported in THE LANCET last year (Young 1936). In these experiments the daily injection of a crude extract into dogs produced, on the third or fourth day of injection, a condition characterised by the symptoms of diabetes. It was found, however, that the symptoms disappeared after a few days in spite of the continued daily injection of a given dose of crude extract, although reappearance of the symptoms followed each successive increase in the amount administered daily. Subsequently, as recorded below, an effort was made to determine whether it was possible to inject a dose sufficiently large to overcome completely the animal's power of becoming resistant, and the amount of extract given daily was increased until a very high level of dosage was reached. In two out of three experiments of this type the dogs not only failed to overcome the diabetogenic action of the extract but remained diabetic after the injection of extract was stopped. In these two instances the diabetic condition appeared to have been permanently established.

METHODS

The methods used in these investigations will be described in detail in a general paper on the diabetogenic action of pituitary extracts to be published soon. It may be said here, however, that the extract used was prepared from fresh ox anterior pituitary glands by a method essentially that described by Schockaert (1931). Glands removed from cattle shortly after death were used, the material being transported to the laboratory frozen in solid carbon dioxide. Dissection of the anterior lobe was carried out while the glands were in a frozen condition, and the extraction and subsequent manipulations were all carried out as near as practicable to 0° C. The extract was stored at 0° C. without freezing, and was always used within five days of preparation. Preparation and conservation of the extract at low temperature is essential for satisfactory results in these experiments. Injections were made intraperitoneally, particular care being taken to avoid infection of the skin and abdominal wall. The dogs received a meat diet to which was added a small amount of dog biscuit. They were allowed exercise daily, with inevitable loss of urine, so that the figures given for urinary excretion in this paper are minimum values. Urine sugar was estimated by Benedict's method, and urinary ketones were assessed semi-quantitatively on the basis of the intensities of the Rothera and Gerhardt tests, the results being expressed in terms of an arbitrary scale on which the figure 5 indicates that the ferric chloride test was just positive with a 24-hour urine volume of 1000 c.cm. Blood-sugar was estimated by a modification of the Hagedorn-Jensen method.

RESULTS

DOG 28*

Male fox terrier. Original weight 11·9 kg.—The daily urine volume and urinary sugar and ketone excretion of this animal for the period of pituitary injections and for four weeks after are shown in Fig. 1. The first arrow indicates the time at which daily injections were begun. Subsequent arrows indicate the days on which the amount of extract injected daily was increased, the figures on the arrows showing the weight of fresh ox anterior lobe in grammes used to prepare the amount of extract injected daily.

The daily administration of an extract of 10 g. of gland (abbreviated for convenience to 10 g. of extract) resulted in an increase of urine volume and the appearance of ketonuria on the third day, but the excretion of sugar did not begin until the fifth day of injection. On this day the amount of extract injected daily was increased to 15 g.; this resulted in a rise of the daily sugar excretion to 46 g., after which the glycosuria decreased until the urine became sugar- and ketone-free on the eleventh day of injection. An increase in the amount of extract injected daily, to 20 g. on the eleventh day and to 25 g. on the sixteenth day of injection resulted, in each case, in the reappearance of glycosuria and ketonuria. The glycosuria resulting from the daily injection of 25 g. of extract remained at an average of about 50 g./day for 9 days and

* The reference numbers are those of the series of animals used for general investigations on the diabetogenic action of pituitary extracts.

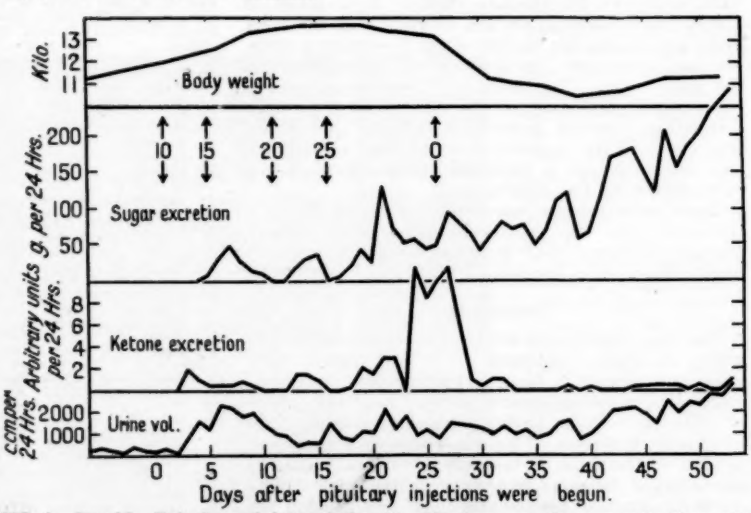

FIG. 1.—Dog 28. Data for period Day 0–Day 53. The figures on the arrows give the weight of fresh ox anterior lobe used to prepare the amount of extract injected daily, from the day indicated by the arrow, onwards. Injections were stopped on Day 26.

exhibited little or no tendency to decrease, while the ketonuria increased markedly on the twenty-fourth day of injection.

On the twenty-sixth day the animal passed into a semi-comatose condition; at this time the CO_2-combining power of the blood was 29 vol. per cent. Injections were stopped on this day, with the result that the ketonuria decreased, but the glycosuria persisted and after a few days began to increase. This increase in sugar excretion accompanied a marked increase in food consumption. Four weeks after the cessation of injections the sugar excretion had reached 264 g./day (24 g./kg./day), at which time food was withdrawn for 48 hours. During the first day of fasting the animal excreted 26·5 g. of sugar; during the second day, 22·8 g. The blood-sugar at the end of 48 hours' fast was 256 mg./100 c.cm., compared with 300–460 mg./100 c.cm. at other times.

As has been observed in other dogs, the body-weight increased during the period of pituitary injections, even

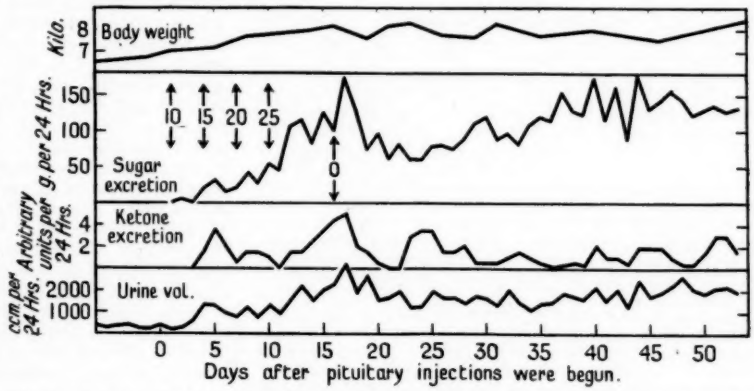

FIG. 3.—Dog 40. Data for period Day 0–Day 53. The figures on the arrows give the weight of fresh ox anterior lobe used to prepare the amount of extract injected daily, from the day indicated by the arrow, onwards. Injections were stopped on Day 16.

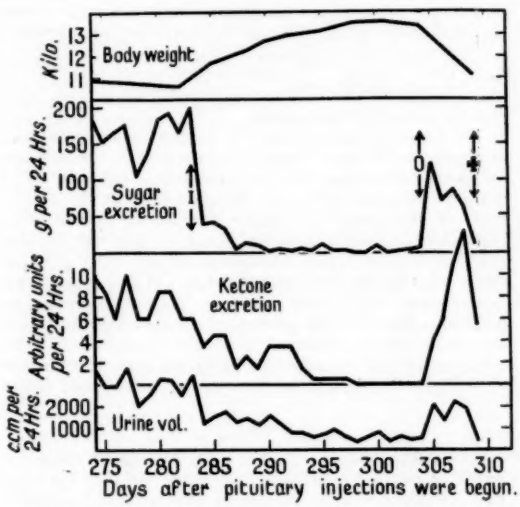

FIG. 2.—Dog 28. Data for period Day 274–Day 309. At the first arrow the daily injection of 60 units of insulin was begun. Insulin administration was stopped on the day indicated by the second arrow. Death occurred on Day 309.

though the animal was excreting sugar during most of this time. After the cessation of injections, however, the weight fell until a level of about 11 kg. was reached—2·5 kg. below the maximum. At this time the animal appeared very thin, but nevertheless was quite strong and vigorous and very different from the depancreatised dog, in which a similar uncontrolled glycosuria is associated with progressive emaciation and asthenia.

Dog 28 became permanently diabetic at the beginning of September, 1936. Insulin was not administered until the beginning of March, 1937, and then purely as an experimental procedure, as insulin therapy seemed unnecessary for a vigorous and prolonged life. From September, 1936, until March, 1937, the only progressive change in the animal's condition was a gradual rise in ketone excretion, from an average of 0·5 on the arbitrary scale, in September, to 7 in March. The sugar excretion averaged about 170 g./day during this time.

During the first period of insulin injections the animal was allowed to eat as much as he wished. The amount of insulin given was slowly increased until the urine was nearly free from sugar. 100 units of insulin daily, given in three injections before meals, was required to keep the urine almost free from sugar and ketones during the time the animal's weight was increasing. The body-weight became constant at about 13·5 kg., which was the animal's weight at the end of the period of pituitary injections. After this body-weight was reached the animal's appetite diminished, and 75 units of insulin daily were then sufficient to keep the urine volume low and the urine nearly free from sugar and ketones. The result of stopping insulin administration was the immediate reappearance of the symptoms of diabetes. The body-weight fell to 11 kg. in eight days, during which time the ketonuria was very severe, reaching 13 units. Probably as the result of ketosis the animal's appetite became very poor, so that the glycosuria averaged only 83 g./day for 11 days after the cessation of treatment. Later the appetite was regained and the sugar excretion averaged 170 g/day and the ketonuria 8 units/day from March until the end of May, 1937, when a second period of insulin treatment was begun. During this period the dog was given 60 units of insulin a day, in three doses, before meals, and a fixed amount of food daily—300 g. of raw horse meat, 300 g. of cooked horse meat, 210 g. of cooked liver, and 90 g. of dog biscuit.

The observations recorded during this period are shown in Fig. 2. After 21 days of treatment, insulin administration was stopped. This resulted in the animal becoming very ill, and death occurred in coma on the sixth day after the cessation of treatment—i.e., nearly 10 months after pituitary injections were stopped. In my unavoidable absence Dr. G. L. Brown and Dr. W. d'A. Macock kindly carried out the autopsy immediately after the death of the animal. The liver was large and obviously fatty, weighing 1030 g. (9·2 per cent. of the body-weight). The pancreas weighed 52 g. and exhibited small petechial hæmorrhages in the head and body; this, together with the presence of two small areas of recent fat necrosis indicated the existence of some (probably terminal) pancreatitis. On pressure blood oozed from the mucous membrane of the stomach and duodenum, which appeared œdematous and very congested. The spleen appeared congested. There were no other obvious macroscopic abnormalities. A detailed histological report on the condition of this and other dogs will be published later.

DOG 40

Male black-and-tan terrier. Original weight 7 kg.—In this experiment the amount of pituitary extract injected was increased from 10 to 15 g. on the fourth day of injection,

from 15 to 20 g. on the seventh day, and from 20 to 25 g. on the tenth day of pituitary administration. In this way the animal was made to remain continuously diabetic after the third day of injection. After six days of the administration of 25 g. of extract, injections were stopped but the animal continued to excrete sugar and ketone. Observations on this animal for the period of pituitary injections and for five weeks after are shown in Fig. 3. The most striking difference between these results and those for Dog 28 is that Dog 40 did not significantly lose body-weight after pituitary injections were stopped, even though the urinary sugar excretion averaged nearly 17 g./kg./day. At the time of writing (July, 1937) this dog is alive and well more than two months after pituitary injections were stopped, and has increased somewhat in weight during the last few weeks. His sugar excretion averages 90 g./day on a limited diet of meat only, the D/N ratio being about 3·3/1 and the blood-sugar averaging 300 mg./100 c.cm. It should be recorded that an abscess developed a few days after pituitary injections were stopped. This healed within a week without treatment and apparently had no effect on the animal's well-being but may account for the increased ketone excretion between the 22nd and 29th days (Fig. 3).

DOG 41

Male brown Irish terrier. Original weight 10·6 kg.— This animal was treated in a manner similar to that for Dog 40, but did not excrete sugar and ketone until the second day of treatment with 15 g. of extract daily. Dog 41 thus appeared to be rather more resistant to the diabetogenic activity of crude pituitary extract than other dogs treated similarly. During three days of the daily administration of 25 g. of extract the sugar excretion fell to 5 g./day and in spite of an increase of the daily injection to 30 g. of extract, the animal ceased to excrete sugar and ketone. Subsequently the injection was raised to 35 g./day and though the sugar excretion then rose to 128 g./day (11 g./kg./day) the animal ceased to excrete sugar after 13 days of this treatment. It is interesting to note that this dog's mammæ contained a milk-like fluid at the close of the experimental period, although the mammary glands had never received treatment with ovarian hormones. During the period of pituitary injections the animal's body-weight rose from 10·6 to 12·75 kg. and at the end of this period it was extremely lively and vigorous. Two weeks after the cessation of injections the body-weight had fallen to a constant value of 10·9 kg. and the animal was somewhat subdued, although later his former high spirits were, to some extent, regained.

DISCUSSION

According to Houssay, the diabetic condition produced by the injection of anterior lobe extract disappears in one to three days if the administration of extract is stopped (Houssay 1936). Similar observations have been recorded by other investigators. Evans (1933) found that the diabetic condition may disappear even though injections are continued, an observation which was confirmed early in the present research. Further investigation showed that the symptoms reappeared if the amount injected daily were suitably increased (Young 1936). By the daily injection of a growth hormone preparation for 8–9 months, Evans, Meyer, Simpson, and Reichert (1931) produced in two dogs (but not in two litter mates) a diabetic condition which persisted for some weeks after treatment was stopped, but hitherto there has been general agreement that the diabetes produced by the administration of pituitary extract is a transitory condition only.

The animals considered in the present paper differ from depancreatised dogs in a number of respects, most strikingly in that they are able to survive for a long period without insulin treatment. Moreover Dog 40 has gained rather than lost weight since the diabetic condition became established. Dog 28 was unwell only when insulin was stopped after a period of administration. This condition seemed to be associated with the loss of the additional body-weight acquired under the influence of insulin, and when, after the first period of insulin injections, the body-weight had returned to the pre-insulin level, the condition of the animal was greatly improved. It seems possible that this dog would have survived much longer, perhaps for some years, if the body-weight had been allowed to remain at a low level all the time. The results of the classical investigations of Allen (1914, 1920) on the relationship between body-weight and the severity of the diabetic condition in partially depancreatised animals are of importance in this connexion. However, it must be stressed that, in the present investigations, Dog 40 has exhibited a heavy glycosuria over a period of two months, without loss of body-weight or a progressive increase in the severity of the symptoms of diabetes.

According to my experience, gained in the laboratory of Dr. C. H. Best in the University of Toronto, depancreatised dogs require rather less insulin than did Dog 28 to maintain the urine relatively free from sugar and ketone under similar conditions. It is not possible to make a definite statement on this point, however, until depancreatised dogs have been compared with the present animals under similar conditions. It should be stressed that at no time have the pituitary injected animals exhibited signs of deficiency of external pancreatic secretion; they pass normal fæces quite different from the white excretion of depancreatised animals. The sugar in the urine has been definitely characterised as glucose by a comparison of the rotatory and reducing powers, and by the form of the osazone.

At present, speculation as to the reason why the diabetic condition became permanently established in the present cases will serve no useful purpose. The pancreases have yet to be examined as to the condition of the islets of Langerhans, and it remains to be definitely established whether or not the insulin requirement of these animals is significantly greater than that of depancreatised dogs. It is proposed to investigate these and cognate points as soon as possible, but for the present it is desirable to point out that the permanent diabetes provoked by the administration of anterior pituitary extracts differs in certain respects from that of depancreatised dogs.

SUMMARY

1. As the result of the daily administration of anterior pituitary extract, two dogs became diabetic and remained so after injections were stopped without showing any signs of recovery. A third animal treated similarly became only temporarily diabetic.

2. The permanent diabetes produced in this manner differed from that of depancreatised dogs in that the pituitary dogs appear to be able to survive without insulin, retaining good vigour, and in one case, without loss of weight.

3. The one animal treated experimentally with insulin required 60 units (4·4 units/kg.) each day to keep the urine almost free from glucose on a normal (high-protein) diet.

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GONOCOCCAL PYONEPHROSIS

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IN spite of the great frequency of gonococcal infection of the lower urinary tract, similar infections of the upper tract are remarkably rare. Gonococcal infections of the kidney have been diagnosed upon presumptive evidence, but proof of such an infection is not often found. Only 13 cases of proved gonococcal infection of the kidney have been reported since the gonococcus was discovered 57 years ago.

The following is a report of a proved case of gonococcal pyonephrosis:—

A male nurse, aged 36, was admitted to St. Charles' Hospital, London, on Oct. 21st, 1936. He had been suffering from a urethral discharge for ten weeks and weakness and malaise for four weeks. There was no previous history of venereal disease. During the late war, while serving in India, he had suffered from sand-fly fever, and for the past 10–15 years he had been worried with a troublesome cough and expectoration of sputum. During this period he had also suffered from periodic attacks of pain in the left loin. These pains did not radiate, nor was there any hæmaturia, frequency, or dysuria. One year previously he had been admitted to Highgate Hospital suffering from epigastric pain and vomiting. A radiogram after an opaque meal gave evidence of a duodenal ulcer and after eight or nine weeks' hospital treatment he was discharged as cured.

Present illness.—He had had a urethral discharge for ten weeks before admission. This he treated himself, with irrigations of potassium permanganate solution, until four weeks before admission, when he became ill and had to remain in bed. He developed pains in the left loin, anorexia, vomiting, pyrexia, and heavy sweats, and he lost appreciably in weight. He had noticed that his urine had become thick and muddy, although the urethral discharge had almost disappeared. He had been suffering from a cough and expectorating thick sputum for some months.

Physical examination.—Temperature 98° F., pulse-rate 86, respirations 20, blood pressure 136/78. The patient was thin, sallow complexioned, and appeared to be rather ill. Tongue furred. Teeth good. Heart and central nervous system normal. Lungs: air entry good, percussion note normal; râles at bases. Abdomen: a large rounded, slightly tender mass was palpated in the left loin; it moved with respiration and appeared to be fluctuant. Genitalia: slight purulent urethral discharge. The scrotal contents were normal. The urine was muddy, containing much pus, albumin, and red blood-cells. Urethral smear showed a large number of pus cells and Gram-negative intracellular and extracellular diplococci, morphologically indistinguishable from gonococci.

A provisional diagnosis of gonorrhœa and pyonephrosis was made and further investigations were carried out. Wassermann and Kahn tests were negative and the gonococcal complement-fixation test was weakly positive. The complete blood count resulted as follows:—

Hæmoglobin	70%	Polymorphs	56%
Red cells	4,240,000 per c.mm.	Lymphocytes	39%
Colour-index	0·83	Eosinophils	1%
White cells	8000 per c.mm.	Basophils	0%
		Hyalines	4%

Radiogram of lungs showed evidence of old tubercular infiltration at right apex. The sputum was examined for tubercle bacilli on five occasions but none was found. Radiogram after opaque meal demonstrated a large dilated hypotonic ptosed stomach with a large filling defect on greater curvature, probably due to pressure from without. At a later stage of the opaque meal examination the splenic flexure was seen to be pushed uniformly downwards to about the level of the iliac crest. The level of the hepatic flexure was not much altered. The duodenal cap was within normal limits. These points are shown in the Figure.

Intravenous pyelography (Uroselectan B) showed the right kidney to be hypertrophied, and the left renal pelvis and calyces were not shown in any of the serial films taken. The dye was well shown in the right renal pelvis five minutes after the intravenous injection.

Progress.—During the first week in hospital the patient became worse. The temperature was swinging 99°–101° F., the pulse-rate ranging from 80 to 90. He sweated profusely and vomited occasionally. The tumour in the left loin was increasing in size. The intravenous pyelography confirmed the diagnosis of left pyonephrosis, showing that the left kidney was functionless and the right kidney was functioning well. A consultation was held with Mr. C. Jennings Marshall, who agreed with the diagnosis and advised operation. Preparations were made for a blood transfusion to be given, if necessary, at the time of operation.

Operation.—Spinal anæsthesia, 16 c.cm. of 1/1500 percaine, intrathecally. A left lumbar incision was made and the renal tumour exposed. It was found to consist of a very large pyonephrosis. It was separated from the perirenal fascia and after aspiration it was removed. The ureter was not dilated and appeared to be constricted at its junction with the mass. Several large corrugated drains were inserted into the cavity and the wound partially sutured.

Pathology.—The tumour consisted of a large pyonephrosis, ovoid in shape, and about nine inches long by five inches in diameter at its widest part. It consisted of a sac containing pus, the renal tissue being compressed into a thin layer in the capsule, the whole containing over two pints of frank pus. A swab of pus was taken for culture and films were made.

Bacteriology (Dr. G. W. Goodhart).—Microscopical examination of smears showed large numbers of pus cells and some Gram-negative intracellular diplococci morphologically indistinguishable from gonococci. No other organisms were seen in the smears. A culture was made on blood agar and this gave a pure growth of small translucent colonies of a Gram-negative diplococcus. In subculture no growth was obtained on blood agar at room temperature; at 37° C., a fairly free growth was obtained on ordinary agar and this was continued from agar to agar for several subcultures. The organism fermented glucose, but not lactose, maltose, or saccharose. A suspension of the organisms was tested against a stock gonococcal antiserum in a series of complement-fixation tests and was found to act as a satisfactory antigen. The organism is therefore regarded as a gonococcus. The growth on agar in subculture was somewhat unusually free, but some typical strains of gonococcus have shown a similar growth on the particular agar used in this laboratory—a digest-broth agar.

Subsequent course.—After the operation the patient was rather ill, although he felt definitely better. During the following four days the temperature was swinging from 100°–101·5° F., and the pulse-rate ranged from 100–110. There was a free purulent discharge from the wound, and after a week the temperature and pulse-rate fell to normal, and the patient rapidly improved. Two weeks after the operation he had a slight urethral discharge from which gonococci were cultured, and urethral irrigations were recommenced. Three weeks after the operation the wound was almost healed and after five weeks it was closed and the patient was allowed up. At this stage the urethral discharge had disappeared and the urine was clear with no threads. Further investigations were now carried out. Rectal examination revealed a small soft prostate; the seminal vesicles were palpable but nothing abnormal was felt in the Cowper areas; smears after massage were negative for leucocytes and organisms. Examination of urine: no leucocytes, red blood-cells, or casts were seen, and on culture there was a scanty growth of diphtheroids. Anterior urethroscopy demonstrated Cowper's ducts but nothing abnormal was seen. Cystoscopy: the mucous membrane of the bladder appeared normal; the right ureteric orifice was normal, and the left was not functioning.

DISCUSSION

It is sometimes stated that a renal infection in a patient suffering from gonorrhœa is due to a gonococcal infection. Generally, however, it will be found on investigation that the infection of the upper urinary tract is due to other organisms (Nixon 1911), such as the tubercle bacillus (Marcuse 1903), the *Bacillus coli* (Sellei and Unterberg 1907), or the staphylococcus. In cases where a patient has either recently suffered, or is suffering, from gonorrhœa, and who has Gram-negative intracellular diplococci in ureteric specimens of urine or in the pus from the kidney, it is reasonable to suppose, for purposes of treatment, that the patient is suffering from a gonococcal infection of the kidney. (We consider that cystoscopy and catheterisation of the ureters in a patient suffering from gonorrhœa is definitely contra-indicated.)

In such cases as these, however, there have been reports of instances where the organism found in the kidney has been the meningococcus or some other organism of the Neisserian group. The report of Shivers (1923) clearly demonstrated this last possibility, for he obtained, from a kidney, a Gram-negative intracellular diplococcus which, morphologically, could not be differentiated from the gonococcus, but which by fermentative and immunological tests proved to be the *Micrococcus catarrhalis*.

Various other cases in which sufficient proof of identification was not obtained may be mentioned—viz., Westenhoeffer's case (1906) of meningococcal cystitis, and Reuter's case (1905) of meningococcal periorchitis.

These few examples serve to show that to diagnose a gonococcal infection of the kidney complete bacteriological methods are necessary. By the examination of a smear stained by Gram's method, and of cultures, the identification may be narrowed down to the gonococcus, the meningococcus, the *Micrococcus catarrhalis*, and unnamed Neissereæ.

By fermentative or serological tests the gonococcus may be identified. In the case reported above the organism fermented dextrose only, and when used as an antigen and titrated against known antisera in a series of gonococcal fixation tests gave the same results as when the same tests were performed with the usual antigen.

It is worthy of record that in our case the organisms, which were proved by fermentative and serological tests to be gonococci, were grown in subculture on a digest-broth agar. It is usually stated that the gonococcus will not grow on ordinary agar, but Vaunod (1906) and Wildboltz (1903) and others have isolated organisms that they proved to be gonococci on such media. It is possible that strains of gonococci that have been found in the body in conditions not usual for them, such as in a pyonephrosis, will grow on media that are ordinarily unsuitable. It is well known that gonococci will frequently grow after inoculation on ordinary agar if a heavy transfer of pus is made on to the medium. The gonococcus will frequently grow in subculture on the digest-broth agar which was used for these tests but will not do so on ordinary agar.

In 1930 the literature of gonococcal renal infections was collected and reported by Parmenter, Foord, and Leutenegger. The period covered over fifty years since the gonococcus was discovered and there were 58 references, with 164 case reports. Of these, 104 were discarded either because they were reported before 1879, the year Neisser discovered the gonococcus, or because they were cases reported after 1879 but which had no bacteriological examinations. The remaining 60 cases were divided into three groups, according to the bacteriological investigations done:

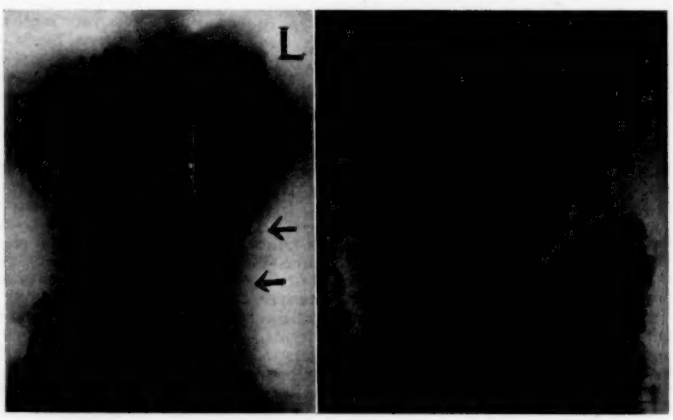
(1) Possible group (28 cases), in which smears only were done.

(2) Probable group (27 cases), in which smears were supplemented by cultures.

(3) Proved group (5 cases), which were proved by fermentative and/or serological tests.

To this latter group of 5 cases they added 4 of their own, making 9 proved cases.

Since this paper was published there have been a number of additional references to gonococcal infection of the kidney, but we have only found 4 case reports where absolute proof of gonococcal infection has been supplied. Of these Okada (1934) reported two, Kessler (1932) and Uhle (1934) one each. These, together with the case now reported, making 14 altogether, are the only reported cases in which the gonococcal infection of the kidney has been proved beyond all doubt.



Radiograms showing, left, large filling defect in greater curvature of stomach; right, splenic flexure of colon pushed down to level of iliac crest.

The route of infection of the upper urinary tract has been so well discussed by Kessler (1932), Johnson and Hill (1924), Simmons (1922) and others, that we shall not attempt to do so here. In our case the appearance of the pyonephrosis at operation suggested that it was first a hydronephrosis which became infected. The history that the patient had suffered from severe attacks of pain in the left loin for about 15 years also suggests that this view is reasonable. Therefore it is suggested that a primary renal abnormality has been secondarily infected by the gonococcus.

SUMMARY

1. A proven case of gonococcal pyonephrosis is described, the cultures from which were pure and contained only gonococci.

2. The tests by which the gonococci were identified include the necessary fermentative and serological tests.

3. The organisms grew in subculture on a digest-broth agar. This fact is not evidence against their identification as gonococci but does suggest a viability above the average.

4. Including the case presented here, there have been only 14 cases of gonococcal infection of the kidney reported where the diagnosis has been proved beyond all doubt.

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PNEUMOLYSIS
COMBINED WITH EXTRAPLEURAL PNEUMOTHORAX AND OLEOTHORAX

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THIS paper has been written to describe a method of treatment of pulmonary tuberculosis which has been revived in recent years in Germany and which is arousing considerable interest on the Continent.

Since the value of artificial pneumothorax has been recognised, workers have tried to find means of collapsing the lung in cases where intrapleural adhesions prevent satisfactory collapse. This problem has stimulated the development of cauterisation of adhesions and such operations as phrenic nerve paralysis, pneumolysis, and thoracoplasty.

Recently I had the opportunity of visiting Graf's clinic at Coswig, near Dresden, where the method of pneumolysis combined with extrapleural pneumothorax and oleothorax has been in use for three years. I also visited the tuberculosis hospital in Heidelberg where Schmidt has treated the largest number of cases. The value of the treatment in their hands is undoubted.

HISTORICAL

Pneumolysis combined with wax plugging has enjoyed a certain degree of popularity, chiefly on the Continent, since Baer introduced it in 1913. The quantity of wax which can be used is of necessity limited and the degree of collapse is not great. That this operation has not been used more widely is due to the fact that after a time the wax often begins to extrude itself. Other substances have been employed such as rubber, oil, pieces of rib, sponges, and adipose tissue, but their use has been short-lived. In view of its success intrapleurally, air was suggested and employed as a filling medium by Tuffier (quoted by Bernou and Fruchaud (1935)) at the end of the last century, Zorini (1933), Riviere and Romanis (1923), Nissen (1932), and Romanis and Sellors (1935) among others. Any successes reported, however (Jessen; Rieckenberg 1920), appear to have been largely fortuitous. Great difficulty was experienced in preventing the air from escaping, thereby causing subcutaneous or mediastinal emphysema, and in preventing adhesion-formation with subsequent obliteration of the cavity. In 1932 Sebestyén reported a method of combining extrapleural pneumolysis with intrapleural pneumothorax, which resembles the method to be described in many respects. Zorini (1933), with his "apicolyse semplice," and Michelsson (1935) contented themselves with performing pneumolysis over the diseased area of lung without taking measures to maintain the collapse. As a method of treatment, therefore, extrapleural pneumothorax did not attract much attention until 1934, when Graf began to develop the method which is now in use on the Continent (Graf 1936).

THE METHOD

It is probable that most of the pneumolyses which had been carried out in the past were extrafascial. Graf succeeded in freeing the lung from the chest wall in the layer between the parietal pleura and the endothoracic fascia and in filling the resulting space with air. His early results were so encouraging that he has continued with this method and has operated on more than a hundred patients in the last three years. Schmidt (1936), impressed by Graf's work, has operated on a more extensive series of cases in the last two years, and has modified Graf's technique in some important details. Both Graf and Schmidt stress the importance of freeing the lung in the subfascial layer, as the cavity thus formed is lined with firm cellular tissue and hæmorrhage does not readily occur. In this layer it is usually possible to free the lung all round, including the mediastinal surface as far as the root, and indeed Graf has succeeded in performing a complete extrapleural pneumolysis. The walls of this space are sufficiently firm and elastic to allow of the maintenance of an artificial pneumothorax without using positive pressures. Should the space become smaller in spite of refills and threaten the re-expansion of the collapsed area before the end of two or three years, there still remains the possibility of maintaining the collapse with oil.

OPERATIVE TECHNIQUE

For details of the operation reference should be made to an article by Adelberger (1936). Here I shall merely summarise the method at present used by Graf and Schmidt. They prefer local anæsthesia with 0·5 per cent. novocain. The sitting position for the patient is used, support being provided by a special bolster and pillows. Through a paravertebral incision a piece of the third rib 5–6 cm. in length is resected. The intercostal nerve is cut. The correct layer is found by locating the parietal pleura and working first with the finger and then with a swab on a holder in the fascial plane, which separates easily with a characteristic crackling sound. Care must be taken to carry out the pneumolysis very gently and to avoid pulling any adhesions which may be attached to the ribs. The whole procedure is performed under direct vision, and to make this possible a special lamp which can be placed inside the wound is indispensable. The lung should be freed as far down as seems necessary, allowing ample margin for the inevitable shrinking in the size of the pneumolysis cavity. The mediastinal surface especially should be freed as far as the lung root if this is

possible. If the pneumolysis can be carried out entirely subfascially, appreciable hæmorrhage will not occur. Occasionally slight bleeding is seen when the pleura is adherent to a rib. If there is bleeding of any severity it can be controlled without undue difficulty, as the whole operation is performed under direct vision. As the freeing of the lung takes a considerable time to complete, it is advisable to cover the lung, where already separated, with gauze swabs to prevent excessive cooling, and to control the mediastinum should the patient cough during the operation. When the lung has been separated to the desired extent there is a cavity occupying up to half of the hemithorax. The wound is closed by stitching the intercostal muscles as firmly as possible to prevent leakage of air. The subcutaneous tissue and skin are stitched in the usual manner. Graf leaves a small rubber de Pezzer catheter in the wound, attached to an apparatus for maintaining a constant zero pressure in the cavity, for 24–36 hours. Schmidt, on the other hand, closes the wound primarily, for he fears infection of the cavity.

AFTER-CARE

The patient is radiographed immediately after the operation and the degree of collapse is clearly seen. At the beginning screening control is carried out daily to determine the frequency of refills. Soon after the operation a fluid level can be made out in the cavity. This consists of blood and serum, and as a rule gives rise to very little trouble. Occasionally the fluid has to be aspirated but it seldom returns. The technique of refills is exactly the same as with intrapleural pneumothorax, but a longer needle is usually required. Refills should be carried out through the space left after resection of the rib, for this area is anæsthetic. The swing of the manometer is considerably less than with intrapleural pneumothorax, and smaller quantities of air are sufficient to maintain the collapse; seldom more than 200 c.cm. is required. In a number of patients the pneumothorax can be maintained as if it were intrapleural. In some patients, however, the lung tends to re-expand in spite of refills. A condition then occurs comparable to obliterative pleurisy. In these cases both Schmidt and Graf fill the cavity with oil. They use Jodipin 20 per cent., but an oil containing bromine is at present being experimented with. The technique of filling the cavity with oil is the same as that of intrapleural oleothorax. The oil is best given at least a week after the initial operation, for then the walls of the cavity are firm and the possibility of rupture into the lung is minimised.

COMPLICATIONS

Complications during the operation are for the most part not serious. Immediate hæmorrhage can usually be controlled by means of electro-coagulation, since the whole proceeding is carried out under direct vision, as mentioned above. Small tears of the pleura have occurred, but have not caused any subsequent trouble. No cases of air embolism have been encountered. After the operation, subcutaneous emphysema is often met with, but it has never exceeded that normally met with after thoracoscopy. Neither Graf nor Schmidt have seen mediastinal emphysema. Delayed hæmorrhage has taken place but has been controlled in each case by aspiration. Infection of the cavity is very rarely encountered, but it is a possibility and is certainly more liable to occur when drainage is used. Schmidt has had no cases of infection since he began to close the wounds primarily. In the cases of extrapleural oleothorax, perforation of the oil internally or externally is rare, presumably because the walls of the cavity have been allowed to stiffen up sufficiently before the oil is introduced. Spontaneous pneumothorax has occurred in one case of Schmidt's.

INDICATIONS

The indications are the same as for an intrapleural pneumothorax; that is to say, relatively fresh infiltration with cavitation and early infiltration which is tending to spread but cannot be controlled by intrapleural pneumothorax because of adhesions. Sanatorium treatment with adequate rest should of course be tried first, and the intervention should only be carried out if the disease still shows signs of activity. Owing to its selectivity, almost no normal lung tissue is put out of action as almost always happens with intrapleural pneumothorax; therefore it is of use in patients with poor air reserve or in cases with bilateral apical lesions. It may be substituted for an intrapleural pneumothorax when the collapse obtained from this is non-selective owing to adhesions too extensive to be cauterised. An intrapleural pneumothorax which is controlling disease of the middle or lower lobes, although not exerting any influence on the upper lobe, may be combined with extrapleural pneumothorax to make the collapse effective.

Cases with large apical cavities and old stiff-walled cavities with much fibrosis and displacement of the mediastinum are unsuitable for this treatment, for they require permanent collapse measures. If for some reason the immediate condition of the patient is bad, pneumolysis might occasionally be considered as a preliminary to thoracoplasty. Both Graf and Schmidt consider that thoracoplasty is rendered easier after pneumolysis. In cases of long-standing apical disease it may be impossible to carry out pneumolysis because of adhesions which have formed between the pleura and the surrounding tissue. Partial thoracoplasty would then have to be considered.

RESULTS AND CONCLUSIONS

In three years since this operation was started, over 300 patients have been operated on. Complete statistics are not yet available. In November, 1936, Schmidt reported 3 fatal cases out of approximately 100 operated on. Graf early in 1937 reported 7 deaths in 107 cases; all 7 occurred in the first 40 cases, and in the last 67 there has been no mortality. In no instance could death be ascribed to the operation itself.

It will be evident that sufficient time has not elapsed for the late results of the operation to be assessed. The ultimate fate of the patients in whom an extrapleural pneumothorax has been induced will be watched with interest, for on this will depend the future of the operation. There is undeniably need for a method of treatment less drastic than thoracoplasty for many cases in which artificial pneumothorax is indicated but cannot be carried out. Extrapleural pneumothorax has been evolved in the hope that it will help to meet this need. Graf's and Schmidt's experience seem to justify its wider trial.

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BRITISH MEDICAL ASSOCIATION

SECTION OF ORTHOPÆDICS

Mr. S. T. IRWIN (Belfast), the president, was in the chair at a meeting of this section when Prof. E. W. HEY GROVES (Bristol) opened the discussion on operative treatment and results in

Fracture of the Neck of the Femur

He confined his remarks mainly to treatment by means of the Smith-Petersen nail. It had, he said, changed the whole outlook on fractures of the neck of the femur from rather gloomy resignation to confident optimism. It remained to be seen whether or not that optimism was fully justified. The great merit of Smith-Petersen's nail was that it affords the maximal fixation with the minimum of trauma or destruction of tissue. The three flanges controlled rotation of the bone fragments, while the thinness of the metal blades did little damage to the cancellous tissue of the femoral neck. But it was nevertheless a metal foreign body and as such was a check to tissue formation. When the pin was removed, even in cases which did well, it was often found that the nail track was filled with loose bone debris or granulation tissue. It was unfortunate, said Prof. Hey Groves, that more information as to the end-result by this means of treatment is not available. Some failures must undoubtedly occur, as for instance in cases of interposition of capsule, or in those where new bone formation is so feeble as to be unable to stand any strain. By Whitman's method of treatment 50 to 60 per cent. only of the cases gave firm bony union after a long and tedious treatment. Smith-Petersen's nail would probably give better results; 80 to 85 per cent. bony union might be achieved, and one had also to remember the rapid recovery of function it had afforded to the patients.

The methods of application of the nail might be grouped under three headings—namely: (1) The *open operation*, described and illustrated in the July number of the *British Journal of Surgery*, 1936. In young subjects this was probably the method of choice; it allowed an accuracy which was denied to any method guided only by X rays. It is an unjustifiable operation in old and feeble patients. (2) *Blind insertion over wire guides;* this method, which was associated with the names of Sven Johannson, Jerusalem, and King, had had a great vogue. Its drawbacks were: (*a*) it was a long and tedious operation; (*b*) it depended on the taking and interpreting of many X ray films. (3) *Blind insertion with a mechanical director.* The one designed by the speaker was described. The fracture having been reduced, a two-pronged guide was placed over the line of the bones so that one prong touched the middle of the femoral head and the other the base of the femoral neck. This enabled a drill to be passed accurately into the bone in the true axis of the femoral neck. This method was regarded as the most suitable for old and feeble patients. In after-treatment, eversion of the leg was prevented by a bar fixed to the sole of the shoe. A walking calliper could be used and the patient got up within a week. The nail should be removed after three months; it could do no further good and it tended in time to produce bone atrophy. Cases seen late were probably best treated by bifurcation osteotomy, Schanz's cuneiform osteotomy, or Whitman's reconstructive operation. Prof. Hey Groves summarised the position as follows: (1) The skilled use of a Smith-Petersen nail is the best method of treating intracapsular fractures. (2) The nail is an efficient internal splint. It allows the patient up in a few days. (3) The nail will neither ensure nor encourage new bone formation. (4) The nail can only succeed if it is accurately inserted after perfect reduction. (5) The open operation is to be preferred in young and vigorous patients. (6) For old and feeble patients the blind method with a mechanical guide should be used. (7) In late cases bifurcation osteotomy is the method of choice.

Dr. SVEN JOHANNSON (Gothenburg) said that essentials in treating fracture of the neck of the femur were exact reposition, firm fixation, and good technique. Reposition was best procured by means of traction, which could be either skeletal or by means of strapping. The extension must be such that it would not only correct the shortening but also the outward rotation deformity; and it was also well to have 45° abduction of the fractured leg. After a week's treatment by extension had elapsed and the fracture was completely reduced, fixation was carried out on an extension table with the traction still working. The anæsthetic could be either ether or spinal, though with the latter over-extension might be produced. The nail was inserted under X ray control; it was not enough to verify the position of the nail by a frontal film, but its position in a lateral film should also be determined. The nail should be introduced to a position which is as near axial as possible, for there is much less risk of it "sliding out" in a lateral direction; moreover, in the axial position it has a better chance of replacing those forces which the normal neck of femur has to withstand. After the nail is inserted the fracture is artificially impacted. Dr. Johannson showed some lantern slides demonstrating his complicated apparatus and method of insertion of the nail. The after-treatment required a month in bed with massage and faradic stimulation to the leg muscles and graduated exercises. Crutches were used after getting up for three months during which time repeated radiographic examinations were made. If during the after-treatment it was found that the nail had been extruded and the dislocation recurred, or if the faulty position of the nail had allowed a recurrence of the dislocation, it was quite feasible to remove the nail and replace it in the proper position. Even after all this one could look forward to a good bony union with some confidence. Secondary necrosis was not increased by the operation; this complication seemed to occur more often in the young patient. Cases of pseudarthrosis were best treated by osteotomy, though some did well with the nail. In his hands, said Dr. Johannson, between 80 to 85 per cent. of cases obtained good bony union.

Dr. ELLIS JONES (Los Angeles) outlined the methods of treatment of this fracture:—(1) conservative: Whitman's plaster-of-Paris method; (2) operative: internal fixation by (*a*) Smith-Petersen nail and all its various methods of insertion; (*b*) three eccentric nails placed in the neck of the femur; (*c*) a tibial bone-graft placed in the centre of the neck. He enlarged upon this latter method and mentioned that a subtrochanteric bone-graft could also be used and

(*References continued from previous page*)

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was in fact much better. As it was mainly cancellous bone vascularisation occurred early and hence the graft was beneficial in procuring bony union. It could be reinforced by metal if more stability was required during the early stages of treatment. He considered that the Smith-Petersen nail was being used too frequently and recommended that bone-grafting should be given a wider field.

Mr. ERIC I. LLOYD (London) pointed out that abduction fractures united well with conservative treatment. These fractures should not be dis-impacted and then have a nail inserted. It was difficult to say when bony union had occurred while the nail was in position, some cases refracturing even after 12 months when the nail was removed.

Mr. R. WATSON JONES (Liverpool) said that basal and impacted fractures should be treated in plaster-of-Paris. A good deal depended on the blood-supply of the head of the bone in cases where the Smith-Petersen nail is inserted. If it was intact the result should be perfect; if not osteo-arthritis or avascular necrosis were liable to follow. The operation should be performed within 36–48 hours, the capsule should not be disturbed, and the nail should be left in position indefinitely unless there is some indication for its removal. He mentioned ionisation between the component metals of the nail as the possible cause of its extrusion in some cases.

Mr. H. A. BRITTAIN (Norwich) said 82·6 per cent. of all his cases treated by the Smith-Petersen nail achieved firm bony union. He mentioned the complications liable to follow the operation: slipping out of the nail, external rotation, adduction deformity, and arthritis.

Mr. K. G. PRIDIE (Bristol) used a pneumatic hammer in inserting the nail.

Mr. W. C. GISSANE (London) agreed with Mr. Watson Jones that the capsule should be disturbed as little as possible so as not to impair the already poor blood-supply. He advised removing the nail in 15 to 40 weeks and curetting the cavity. Walking should be as early as the second to the fourth week.

In reply Prof. HEY GROVES noted three points of importance which had emerged from the discussion: (1) there was complete confidence in the nail; (2) an immediate success does not necessarily mean a lasting one; and (3) the nail is of no use after 3–6 months.

In the afternoon several of the speakers showed films illustrating their method of inserting the nail and the results which it produced.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE

AT a meeting of this section under the presidency of DR. GEORGE RIDDOCH, DR. F. M. R. WALSHE (London) opened a discussion on the

Early Diagnosis of Intracranial Tumours

from the clinical aspect. He said that with the steady increase of technical or instrumental aids to diagnosis, it was becoming increasingly difficult to keep a firm grasp of those soun l general principles which must always govern clinical diagnosis. It was painfully common for one to have to make one's way through a barrage of pathological and other reports and through sheaves of X ray films before one got access to the patient. So often these investigations were unnecessary explorations of the irrelevant. He felt that whilst no one would be disposed to dispute this general point of view, many paid but lip service to it. No student of neurological literature could escape the conviction that in neuro-surgical clinics especially, radiographic methods such as ventriculography have come to take pride of place amongst diagnostic methods.

Passing from the general to the particular, the speaker pointed out that the clinical course of an intracranial tumour was likely to follow one or other of certain lines of development.

(1) *Recurrence of generalised epileptiform fits.*—These were clinically indistinguishable from so-called idiopathic epilepsy. Their appearance for the first time in a middle-aged individual should always give rise to the suspicion of tumour. Such fits, in the speaker's experience, were rarely if ever nocturnal. Focal or Jacksonian fits might also occur, but he believed that generalised fits, contrary to popular opinion, were commonest.

(2) The most frequent mode of onset for tumour was that in which the signs and symptoms of *raised intracranial tension* developed—namely, headache, sickness, and papillœdema. The headache often wakened the patient in the early hours of the morning and was most severe at that time. At its worst it was apt to be accompanied by vomiting, the vomiting in turn aggravating it. It was not usually continuous. He had never been impressed by what is spoken of as projectile vomiting, except in young children. Slowing of the pulse was by no means a common sign except in rapidly growing tumours. The rate of rise of intracranial tension was an important factor in the production of bradycardia. A high degree of papillœdema might coexist with a degree of visual acuity which appeared normal to the patient.

(3) Yet another mode of onset was that in which the signs pointed to a *slowly progressive local lesion of the brain*. These might precede the sign of raised intracranial tension, and in such cases it was the time factor as much as the signs themselves that betrayed the probable nature of the lesion. Caution was necessary in interpreting the meaning of a slowly developing unilateral weakness in an elderly man, for a common explanation in his experience was paralysis agitans. Another symptom-complex which had localising value was that in which temperamental changes were the initial symptom. Such changes might occur with tumours in situations other than in the frontal lobe, but opening of the clinical course by an increasing apathy and loss of initiative, by defective attention and poverty of ideas was, he believed, pathognomonic of a frontal lobe tumour. When added to this there was unregarded incontinence of urine the picture was characteristic and could not be mistaken. In such cases papillœdema was often long delayed and might be but a terminal symptom.

(4) One other clinical picture called for mention, that of *secondary carcinoma* of the brain, a condition that was probably most common in association with primary carcinoma of the lung. Here the difficulties of diagnosis or localisation were increased by the fact that the secondary growths were usually multiple within the brain and because the leptomeninges might also be infiltrated. Thus when a confused clinical picture was accompanied by signs of raised intracranial tension, progressive cachexia, and loss of weight, secondary carcinoma should always be suspected and a primary growth sought before any question of surgical intervention was raised.

Mr. NORMAN DOTT (Edinburgh) dealt principally with special or accessory methods of diagnosis. He agreed with Dr. Walshe as to the necessity of clinical investigation, which should invariably form the first

line of approach. But the diagnosis of intracranial tumours was a continuous process, each stage in its investigation being interwoven with the others, and gross regional diagnosis was not sufficient. For modern treatment it was necessary to define exactly the outlines of the tumour, its relation to vessels, the ventricles, and so forth. For this purpose it was often necessary to use specialised methods of diagnosis. *Radiography of the skull* was a routine procedure, and though negative findings were the rule the value of a positive result was considerable. Mr. Dott showed a series of lantern slides illustrating the types of abnormality that might be expected—e.g., abnormal calcifications, erosions, hyperostoses, vascular grooves, shifting of a calcified pineal gland, and indications of general increase of intracranial pressure, such as erosion of the posterior clinoid processes and widening of the sutures, especially in children. As to *lumbar puncture* there was a certain danger associated with this procedure in the presence of an intracranial tumour, especially a cerebellar tumour, but he believed that the danger had been exaggerated. Lumbar puncture should only be performed, however, in hospital where facilities for immediate operative intervention were available should dangerous symptoms arise. At this stage, having accumulated his clinical data, radiographed the skull, and examined the cerebro-spinal fluid, the investigator would be well advised to pause. Was the evidence so far obtained unconvincing, or sufficient in itself to enable him to proceed at once to radical treatment? When the symptoms were acute and further accuracy in diagnosis was required for the purposes of treatment, ventriculography or arteriography, or both, should be carried out. *Ventriculography* was not without risk especially in infratentorial tumours pressing upon the brain stem, but this risk could be largely averted by making the procedure an immediate preliminary to operation. Visualisation of the ventricles was effected by the use of contrasting gas, air, or oxgyen, the operation being performed under local anæsthesia. The method was especially valuable (1) in cases where the signs of increased intracranial tension predominated, focal signs being absent or slight; (2) in cases of focal epilepsy; and (3) in those in which it was desired to delineate more accurately the extent of the tumour. Mr. Dott discussed the advantages of using a diffusible substance such as Thorotrast. He was aware that it was said to be a carcinogenic agent but in the past ten years he himself had seen no harmful effects result from its use. *Cerebral vascular radiography* was another method. An outline of the cerebral vessels could be obtained by radiographing the skull immediately after the injection of 5–10 c.cm. of a colloid suspension of thorium dioxide direct into the internal carotid artery. Phlebograms were obtained by radiographing the patient a few moments later; Mr. Dott showed slides illustrating the appearances in tumours of different regions. The method was especially valuable also in the detection of intracranial aneurysms—to verify their presence when suspected, or to localise them exactly, with a view to surgical treatment, when bleeding was the only sign.

Dr. H. L. PARKER (Dublin) said that the early diagnosis of tumours had become important because of the great progress that had been made in the treatment and cure of the condition. The first line of attack lay with the general practitioner; it was of great moment to define clearly the first symptom complained of. Though often difficult to elicit, this was sometimes clearly recalled by the patient or his friends; Dr. Parker gave several illustrations supporting the value in localisation of such symptoms. He was cautious in performing lumbar puncture in cases of suspected intracranial tumour, even when there was no papilloedema. In his experience it was supratentorial tumours, and especially frontal lobe tumours, which were most likely to give rise to untoward symptoms from the formation of a pressure cone.

Dr. ADAMS A. MCCONNELL (Dublin) emphasised the facts that intracranial tumours in the wide sense of space-occupying lesions were not uncommon and were not hopeless; also that investigation by the general practitioner often led to a correct diagnosis. The early morning headache disappearing on rising, or on having a meal or a motion; the early morning vomiting which left the patient with a good appetite and capacity for work, though by no means pathognomonic, were worthy of serious investigation. He thought that operative judgment depended chiefly on clinical knowledge, but that the exact localisation necessary for operation with the least trauma possible often required special instrumental methods of diagnosis.

Dr. T. TENNENT (London) confined his remarks to discussion of the mental symptoms in intracranial tumour. That cerebral tumour was not a common cause of any of the recognised forms of mental disorder treated under certificate was apparent from the statistics of mental hospitals. Nevertheless, abnormal mental symptoms might occur at any stage and in some cases might be the first symptom to appear. Dr. Tennent had analysed 75 cases of cerebral tumour admitted to the Maudsley Hospital over a period of 13 years. An analysis of the post-mortem findings showed that mental symptoms were associated most frequently with growths in the cerebral hemispheres and that they were more common in left-sided lesions. Among the mental symptoms presented were difficulties in concentration, memory defects especially for recent events, irritability and restlessness, amounting at times to acute excitement. Such periods might alternate with retardation and varying degrees of confusion or stupor. In summarising his findings Dr. Tennent stated his belief that the character of the mental symptoms in these cases depended more upon the type of personality and the rate of growth of the tumour than upon its localisation. In slow growing tumours changes in the personality were conspicuous. In rapidly growing tumours disturbances in the intellect were conspicuous and personality changes were slight. No mental syndrome could be associated with a lesion of any one area of the brain.

Dr. GREY WALTER (London) spoke, as a physiologist, on the application of the electro-encephalogram to the problem of diagnosis. This instrument was similar to that used for electrocardiograms and had for its object the detection and amplification of the minute waves caused by alterations in electrical potential in the cerebral cortex. He referred first to the normal α waves or Buerger rhythm. In cerebral tumour a different type of wave was observed, waves of slow pulsation or δ waves, which he had never observed in normal persons. Their time significance was not understood, but certain observations suggested that they emanated not from the tumour itself but from the cortex surrounding it, the function of which was disturbed. In some of the cases examined there was complete absence of any waves, and this "silence" was difficult to interpret. It had no constant significance and often proved misleading. Eighty-seven cases in which cerebral tumour was suspected had been investigated by him at the Maida

Vale Hospital for Epilepsy and Paralysis. Thirty-three of these showed abnormal δ waves, and in all cases the suggested localisation was confirmed at operation. Forty-eight cases gave normal results, and in none of these had a tumour subsequently been verified. Electro-encephalography was undoubtedly of great advantage in the localisation of cerebral tumours. It invoked no danger or discomfort to the patient, but it was limited in its effectiveness. No definite results could be expected unless the tumour were affecting the cortex, which was, at the time, passing through a phase of excitability sufficient to cause the abnormal waves.

Other speakers who took part in the general discussion which followed were Dr. A. Gurney Yates (Sheffield), Dr. Purdon Martin (London), Dr. H. G. Garland (Leeds), Dr. W. Ritchie Russell (Edinburgh), and Prof. E. Mapother (London).—In summing up the conclusions that might be drawn from the discussion, the PRESIDENT emphasised that sound clinical investigations at the bedside still held paramount place. There was no short cut to diagnosis. The additional methods had their value but they must be used sparingly and with judgment. He felt that the psychiatric aspect of the problem especially demanded further study.

REVIEWS AND NOTICES OF BOOKS

Treatment of Some Chronic and "Incurable" Diseases

By A. T. TODD, O.B.E., M.B. Edin., M.R.C.P. Lond., Honorary Physician, Bristol Royal Infirmary. Bristol: John Wright and Sons; London: Simpkin Marshall. 1937. Pp. 203. 10s.

THERE is a body of teaching on the subject of medical treatment that is orthodox, familiar in principle and in greater or less detail to us all. The bulk of it, we believe, rests on sound theory, on sound experience, or on both; some, we are ready to admit, may be feeble, surviving only by virtue of tradition, and inadequately established by critical observation. From time to time a bold new voice is raised in protest, saying "You are half asleep in your orthodox rut; your treatment is all wrong; here is my new way, which accomplishes vastly better results." How are we to judge the new claim, supposing we have no side-lights on the claimant, no supposition that "because he works in So-and-So's department he must be fairly sound"? Such a problem must present itself to many who read Dr. A. T. Todd's work on the treatment of some chronic and "incurable" diseases. He introduces it with a sweeping condemnation of "traditional therapeutics which have years of inadequacy to support them," a praiseworthy plea for the examination and treatment of the whole patient as distinct from the part of him that appears to be diseased, and a protest against any attempt to trace rigid sequences of cause and effect in disease processes. His principle is: observe the patient's symptoms; examine him and discover what lesions or dysfunctions are present; assume that these are the cause of his symptoms, correct them as far as possible, and leave the rest to nature. There is a facile and illogical confidence about this attitude that puts us on our guard as we proceed to read how the principle operates in practice.

Dr. Todd discusses diabetes first, pointing out some of the well-known gaps in our knowledge of this disease, arguing that insulin is to be deprecated because it inhibits endogenous insulin formation, and recommending the treatment of 70 per cent. of all diabetics with Synthalin, for the sake of its depressing effect on glycogenolysis. Insulin is stopped if possible. Dr. Todd admits that 30 per cent. of "total diabetics" show "intolerance" to synthalin, and intermits or even discontinues its use in these. Now in diabetes, the orthodox physician is on well-charted ground, and for him the therapeutic effect of insulin is about as well defined and certain as any in medicine. He will at once be suspicious of this advice to replace it by a known hepatic poison, especially one that was widely tried in this connexion some years ago and abandoned, and he will expect a full justification of the claim for synthalin, complete to the last detail. Instead Dr. Todd hurries on with the airy remark that "nothing is to be gained by describing individual cases," and giving one reference to a few case records in an article five years old. For toxic goitre Dr. Todd opposes surgical treatment because it is "highly irrational"; he looks for medical means of controlling "this pluriglandular dysfunction, in the hope of attaining a satisfactory treatment in time." He lays down the following routine: complete rest in bed, high carbohydrate diet with increased vitamin intake, administration of fluoride and iodine, adding in refractory cases yohimbin, ergotamine, and radiation of thyroid and pituitary. Here again the recommendations differ materially, though not in every detail, from the orthodox management of patients with toxic goitre, in which surgery plays an important part; the results of orthodox management have been assessed and reported carefully enough to serve as a basis of comparison, and Dr. Todd's challenge should therefore be supported by a detailed statement of his own results. Yet his only word on that topic is "they have done well."

Elsewhere Dr. Todd discusses conditions for which the orthodox physician often has no satisfactory or easily judged treatment, such as asthma, hay-fever, "false phthisis" (i.e., chronic bronchitis), "duodenitis and hepatic defect," "false heart disease," acute rheumatism and chorea, and chronic rheumatism. His arguments and his programmes of treatment in these many conditions are a mixture of much that is orthodox and undoubtedly sound, much that is plausible but not established on good evidence, and something that will be to most readers quite strange. Each programme involves many therapeutic measures, some of which, like ethmoid packs, colloidal sulphur injections, and small doses of thyroid, recur often in different chapters. The suggestion is maintained throughout that patients treated on these lines will fare better than those in the hands of the average physician. How are we to know? An attempt at a critical verification of such a claim would take more than one man's time for many years, and might then be inconclusive. We are simply offered Dr. Todd's word for it, backed by his terse, downright, and most persuasive style. But since our criticism of his views on diabetes and toxic goitre has made us wary, we may be unwilling to take all his other treatments at their face value; we may be tempted to see in his style rather than in his prescriptions the secret of his success (for he tells us that his "private patients do not mainly come from the West Country" where he works). Perhaps his confidence, his dogmatic attitude, and his precise insistence on therapeutic detail work wonders with many patients whose chronic ailments have added to themselves the aggravation of despon-

dency. If that be so, the gibe at orthodox treatment, which echoes through the book, is misdirected; it should be aimed at the physician who lacks Dr. Todd's gifts of style and personality.

Finally the author's method of treating inoperable cancer is surveyed. In 1926 he began using injections of a colloidal suspension of lead selenide. The earliest results were the best. Then a sulphur-selenium colloid was substituted and combined with small doses of X rays. Finally a feebly radio-active colloid combination of sulphur with a radium derivative has been added. The details of treatment are elaborate, and the result claimed is the apparent cure of 10 per cent. of 300 unselected cases of inoperable cancer. It sounds striking, and the uninformed reader asks at once why no one else has taken up this promising method, now five to ten years old. He finds in the book no reference to any reports on it except those of the author, and he is left wondering how many of those 30 cases, if described in full and followed over a longer period, would still stand scrutiny as cured. In the end we lay the book down with a feeling of regret. It shows so much both of ability and of enthusiasm, and its story of a long-sustained struggle with the cancer problem cannot escape our admiration. Many of its ideas may indeed be valuable, but we are left on the whole unconvinced, without means of separating the grain from the chaff.

Disorders of the Blood

Second edition. By L. E. H. WHITBY, C.V.O., M.D., F.R.C.P., Assistant Pathologist, Bland-Sutton Institute, Middlesex Hospital; and C. J. C. BRITTON, M.D. N.Z., Assistant Pathologist at the same Institute. London: J. and A. Churchill. 1937. Pp. 582. 21*s*.

IN the two years of its existence this has become a standard text-book. The new edition contains thity-five extra pages, seven new illustrations and 400 alterations, not always modern ones, in the bibliography.

In addition to chapters dealing with recognised hæmopoietic disorders, the blood picture in infectious diseases including parasitic conditions, and in miscellaneous disorders such as allergy, diabetes, and coronary thrombosis is discussed. A chapter is devoted to disturbances of the blood pigments where the interesting suggestion is made that idiopathic sulphæmoglobinæmia may be dependent on splenic dysfunction permitting a ready combination of the hæmoglobin molecule with sulphur. The value of the section dealing with laboratory technique is increased by a fine new coloured plate illustrating the method of supravital staining for leucocytes. The authors have particularly emphasised the value of classifying the anæmias in terms of cell size and hæmoglobin content. On this basis they state that idiopathic hypochromic anæmia is always microcytic, and that the anæmia of acholuric jaundice is always microcytic, though the volume may be normal, and either hypochromic or normochromatic. Such dogmatic statements though possibly of value to the student might well be questioned by the expert. An interesting hypothesis here offered, which if followed up should lead to further knowledge, is that the anæmia associated with leukæmias and lymphadenoma and malignant disease of the marrow is due to disturbances of metabolism. The significance and interpretation of the reticuloyte response to treatment both in pernicious anæmia and in hypochromic anæmias are discussed more fully than in 1935, and this section of the book should prove very useful to those testing liver extracts and other hæmopoietic remedies. Throughout the work gallant attempts are made to present up-to-date knowledge in a readily assimilated form; tables and summaries conclude each chapter, and will earn the gratitude of all students and practitioners of medicine and pathology, who are only too apt to get lost in the maze which hæmatology presents to the uninitiated.

A Textbook of Neuroanatomy

Second edition. By ALBERT KUNTZ, Ph.D., M.D., Professor of Micro-Anatomy, St. Louis University. London: Baillière, Tindall and Cox. 1937. Pp. 520. 27*s*.

THIS is a good text-book. Although it is compact and convenient to hold it contains an up-to-date account of the central nervous system presented to undergraduates by one who is both a research worker and a teacher in this field. A short description of the phylogenetic development of the nervous system and of its ontogenetic development in man is provided in the opening chapters and a section follows dealing with the gross anatomy of the adult human brain and spinal cord. The inclusion in this section of charts showing the formation of the limb plexuses and the segmental innervation of the skin will be a convenience to beginners. A separate chapter entitled Laboratory Outline gives instructions not only for the dissection of the human brain but also for that of a dog-fish and of a 50 mm. pig embryo. The account of the microscopic anatomy of the human brain and cord is illustrated by numerous drawings from microscopic sections as well as by charts showing the course and relations of the long fibre paths.

Advanced readers may wish that the chapter on the autonomic nervous system, coming as it does from a master of the subject, had been less brief. However, within its twenty pages is a good description of the peripheral part of the system, an account of the central autonomic centres and their conduction paths, and an outline of present-day knowledge of the physiology of the autonomic. Several other subjects of importance have received more attention than is usually given to them in books of this size—e.g., cerebro-spinal fluid and its pathways, neuroglia, myelin, the delivery of fillet fibres to the thalamic nuclei, recent observations on the cytology of nerve-cells, difference in calibre of nerve-fibres in relation to experiments in differential nerve blocking, and the problem of left-handedness and unilateral cerebral dominance. At the end of the book a series of simplified case-histories is set out to illustrate the clinical bearing of certain outstanding features in the anatomy of the nervous system.

Principles of Pharmacy

Fourth edition. By HENRY V. ARNY, Ph.M., Ph.D., Dean and Professor of Chemistry in the College of Pharmacy in Columbia University; and R. P. FISCHELIS, B.Sc., Ph.M., Chief Chemist, Board of Pharmacy, State of New Jersey. London: W. B. Saunders Company. 1937. Pp. 1139. 35*s*.

IN this book every aspect of the practice of pharmacy is covered. Each of its six parts deals with a specific section. Parts I and II, comprising approximately one-third of the book, are essentially pharmaceutical. The text is profusely illustrated. Most of the illustrations illuminate the subject matter, but

a few are redundant, notably those of such common objects as bunsen burners, filter funnels, and simple water baths. The galenicals discussed are essentially those of the United States Pharmacopœia, XI, many preparations of which closely resemble corresponding ones of the British Pharmacopœia and the British Pharmaceutical Codex. In view of the rapid growth in the use of compressed tablets the section concerned with their preparation is disappointing. The manufacture of pills is discussed in much more detail. Parts III and IV deal with pharmaceutical chemistry; in the organic section endocrines and pharmaceutical bacteriology are included. The sections on sterilisation and disinfection could be enlarged with advantage. The remainder of the book is devoted to pharmaceutical testing and dispensing. The outstanding feature of the work is the wealth of references included in the bibliographies concluding each chapter; clearly much care and industry have been bestowed upon their compilation. Although intended primarily for students of pharmacy and those engaged in pharmaceutical practice, the book should prove a good source of reference for any practitioner requiring information on pharmaceutical problems.

British Journal of Surgery

THE July issue contains the following papers:—

EVOLUTION AND DEVELOPMENT OF SURGICAL INSTRUMENTS. By C. J. S. Thompson (Royal College of Surgeons, England). Observations on the shape and structure of cutting instruments from 300 B.C. to the nineteenth century.

AN UNUSUAL CASE OF HYPERPARATHYROIDISM. By G. Gordon-Taylor and R. S. Handley (London). Exploration through a cervical incision revealed no tumour, but the radiological and biochemical reports were so definite that a further operation was undertaken and the tumour removed by trans-sternal approach.

REPLACEMENT OF THE SEMILUNAR CARTILAGES OF THE KNEE AFTER OPERATIVE EXCISION. By John Bruce and Robert Walmsley (Edinburgh). Experimental removal of the cartilages in dogs has been followed by their replacement by ingrowth of fibrous tissue. It is suggested that this also happens in man, and that a complete meniscectomy is essential for a satisfactory replacement.

POST-OPERATIVE BLOOD LIPIDS. By Eldon M. Boyd (Kingston, Canada). Twenty-nine cases have been studied before, and from one to five times after, operation. This per se had no effect on the concentration of the blood lipids. Recovery from fever produced a relative lipæmia; thyroidectomy and completion of abortion produced a relative lipopenia.

CHRONIC MASTITIS IN THE AFRICAN NATIVE: ITS RELATION TO CARCINOMA OF THE BREAST. By Maurice Ellis (Nigeria). Mammary carcinoma is known to be rare, but chronic mastitis was found to be very frequent. Nodularity of the breast was present in 72 of 140 cases examined, and cysts in 20 cases. Menstrual disorders were not related.

PULMONARY EMBOLISM: A Statistical Investigation of its Incidence in Twelve London Hospitals in the Decade 1925–34. By Robin Pilcher (London). 731 cases of fatal pulmonary embolism are analysed in which the diagnosis was confirmed by autopsy. Immobilisation of the patient is regarded as a more important factor than the nature of the illness or trauma. There is a definite association between right-sided thrombosis and right-sided operations and injuries.

FIBROMA OF THE KIDNEY WITH CYST. By H. J. Nightingale and S. N. Lytle (Southampton). Successful removal is reported of a tumour as large as a Rugby football. The cyst was probably a late complication caused by obstruction in a thinned out part of the renal tissue.

SCLERODERMA SIMULATING CARCINOMA OF THE BREAST. By Mark Coleman (London). Two cases are reported. The skin changes are localised and well defined, and there is no underlying breast tumour. Biopsy established the diagnosis.

A HITHERTO UNDESCRIBED FRACTURE OF THE PATELLA. By D. M. Meekison (Vancouver). A flake of bone broken off the inferomedial angle of the articular surface of the patella was found at operation in the lateral pouch of the knee-joint. Three cases are described.

PRIMARY SOLITARY DIVERTICULITIS OF THE CÆCUM: a report on 3 cases, with a review of 17 recorded cases. By M. J. Bennett-Jones (Bootle). The pre-operative diagnosis is usually appendicitis. At operation malignant disease may be suspected. The ætiology is discussed.

OSTEOPOROSIS MELOLYTICA. By J. C. Leedham-Green and F. Campbell Golding (London). A case is recorded. The symptoms are pain in the back and difficulty in walking. The radiogram shows areas of calcium deficiency; the fractures rarely show much displacement, and there is no bending of bones.

SALERNITAN SURGERY IN THE TWELFTH CENTURY. By George W. Corner (Rochester, U.S.A.). An historical survey compiled mainly from translations of the Bamberg Surgery and the Surgery of Master Roger.

MAMMARY CANCER WITH GENERALISED TELANGIECTATIC CARCINOMA ("CARCINOMA ERYSIPELATOIDES"). By E. K. Dawson and J. J. M. Shaw (Edinburgh). Trauma (in the case recorded) caused localisation and proliferation of tumour cells in the injured inflamed area. There was already an underlying tumour of the breast and visceral metastasis was widespread. The clinical resemblance to a primary skin lesion is important.

TECHNIQUE OF OPERATION FOR CLEFT PALATE. By W. E. M. Wardill (Newcastle-upon-Tyne). The author's operation introduces two main principles—deliberate narrowing of the nasopharynx, and the dissection of four short palatal flaps, instead of two long ones, to close the cleft.

ANÆSTHESIA FOR HARE-LIP AND CLEFT PALATE OPERATIONS ON BABIES. By Philip Ayre (Newcastle-upon-Tyne). The author is convinced that the anæsthetic of choice is oxygen and ether vapour administered intratracheally through a T tube, one limb of which is open to the air.

FOREIGN BODIES IN THE URINARY BLADDER WITH A REPORT OF TWO CASES. By A. W. Badenoch (London) and R. I. Campbell (New South Wales). The cases reported are: (*a*) a safety-pin in a female bladder, and (*b*) a leather boot-lace in a male bladder. The mode of introduction, diagnosis, and treatment of such foreign bodies are discussed.

RENAL EXTRAVASATION AND REFLUX. By A. R. C. Higham (London). The experimental evidence is examined. The radiograms of a case are described which showed evidence of pyelovenous, tubular, lymphatic, and interstitial backflow.

TUMOURS OF THE URINARY BLADDER, WITH DESCRIPTION OF A NEW ENDOSCOPIC TECHNIQUE. By Terence Millin (London). Using a constant irrigating operating cystoscope of convex sheath pattern, the author resects by means of a rigid loop electrode.

ANEURYSM OF THE INNOMINATE ARTERY TREATED BY SURGERY: report of 3 cases and records of 22 cases collected from the literature. By Frank Rundle (London). Excision was carried out in two of the cases, and ligature of the innominate, common carotid, and subclavian arteries in the third. There were two recoveries.

TREATMENT OF PROSTATIC OBSTRUCTION OTHER THAN BY ENUCLEATION. By Hugh Lett (London). A critical review of the alternatives—perurethral resection, hormone therapy, and vasoligation.

LESIONS IN A RABBIT'S LIVER AND SPLEEN FOLLOWING AN INTRAVENOUS INJECTION OF THOROTRAST. By Harold Burrows (London). The result in the experimental animal, which died with multiple hæmorrhagic lesions, suggests that the use of thorium dioxide for hepatosplenography may not be without danger.

INTESTINAL STRANGULATION. By G. C. Knight (Royal College of Surgeons, England). The relief of strangulation kills experimental animals who are in poor condition. Depressor substances are present in the peritoneal fluid and in the gut blood in human cases of intestinal strangulation. Therefore it may be found that resection in some cases will give better results than simple relief of strangulation.

The issue also contains short reports on rare cases.

THE LANCET

LONDON: SATURDAY, AUGUST 14, 1937

PUERPERAL FEVER CONTRACTED IN HOSPITAL

On the uncomfortable allegations and evidence in the Ashby-de-la-Zouch hospital case, set out at length on another page, our readers can be left to form their own conclusions. Mrs. HEAFIELD, now crippled after an attack of puerperal fever contracted in the hospital, has been awarded substantial damages against the chairman of the management committee (sued in a representative capacity) and against her own medical attendant. Only a year ago, in Mrs. MARSHALL's action against the local authority responsible for the Cleethorpes Maternity Home, there was a similarly successful claim for damages by a patient who had been admitted to a place where—unknown to herself, her husband, or her medical adviser but known to others—there had been puerperal infection. When giving judgment for Mrs. Heafield at the end of July Mr. Justice SINGLETON recalled that the Ashby-de-la-Zouch maternity unit could claim a record of 650 confinements without losing a mother. Yet he naturally felt obliged to suggest that, if these disquieting conditions can be alleged, it will scarcely encourage women to go into hospitals for their confinements. Mrs. Heafield, he bluntly said, would have been far safer at home.

Mrs. Heafield's case is likely to be reviewed in the Court of Appeal. If we refer to it here meanwhile, we do so not so much to challenge or extenuate the judge's conclusions as to suggest certain rather obvious questions which the managers and officers of other maternity hospitals may now be asking themselves. To begin with the mere letter of the law, is every medical practitioner aware of his statutory duty, under the Public Health Act regulations of 1926, to notify forthwith on the prescribed form as soon as he becomes aware that a woman whom he is professionally attending is suffering from puerperal pyrexia? Do all doctors realise that puerperal pyrexia means "any febrile condition" (other than a condition notifiable as puerperal fever) "occurring in a woman within 21 days after childbirth or miscarriage in which a temperature of 100·4° Fahrenheit or more has been sustained during a period of 24 hours or has recurred during that period"? To obey the regulations is only one of many obligations. Where, as at the Ashby-de-la-Zouch hospital, there are several doctors independently treating their private patients in a general ward, what steps are taken to warn one doctor that the patient of another doctor is suspected of puerperal infection? Is it certain that the matron knows when a case has been notified? And does she then warn the other doctors who have, or are about to have, patients in the same maternity block? Or does she keep silence, waiting for the notifying doctor to tell her to give the warning? In the case both of Mrs. Marshall and of Mrs. Heafield an element in the allegations of negligence was the omission to inform the husband of the true position. Mr. Marshall said that, if he had known of the infection in the Cleethorpes Home, he would certainly not have allowed his wife to enter it. Mr. Heafield declared that, if he had been informed earlier of the nature of his wife's illness, he would certainly have insisted upon a second opinion at once. Hospitals will have to bear in mind this essential duty of disclosure. In Mrs. Marshall's proceedings her medical adviser, who had not been told of the existence of infection in the Home, said emphatically that, if he had been informed, he could at least have insisted that no one who had been in contact with the infected case should be allowed to take part in nursing his patient. Then there is the duty to take swabs. One of the allegations of negligence brought by Mrs. Marshall was the failure to take swabs from the whole staff when infection was present; this was the omission of a precaution which might have eliminated the risk of a carrier. At the recent trial of Mrs. Heafield's action one of the medical witnesses called for the defence agreed that swabs ought to have been taken in the early stages; a positive result might have saved much suffering. Of the normal precautions of sterilised clothing, masks, and gloves there should be no need to speak, though considerable time was devoted in Heafield *v.* Crane and Hart to questions of the proper practice. Are these precautions insisted upon as a matter of routine in all our hospitals or are they still omitted in some places unless the doctor gives some special direction for their use? Other points which seem to have impressed Mr. Justice Singleton are that at the Ashby-de-la-Zouch hospital the staff spoke as if they had no instructions; that the need of isolating an infectious patient apparently did not occur to anybody; and that the matron seemed to wait too inelastically for orders from the doctor. "If," said the judge, "a position of danger arises, and the doctor does not communicate with her, she must get into touch with him and must take steps for the protection of the patients in the hospital of which she is matron."

Among minor matters of comment the judge regretted that the doctors did not keep fuller records of their cases and their visits. He left no doubt of his condemnation of the foolish entry of tendentious matter in a hospital report long after the date to which the entry was deemed to refer. The interpolated words purported to support the suggestion that Mrs. Heafield was already suffering from a cold when admitted to hospital. As soon as it was elicited that the entry was a subsequent interpolation, the incident (which may charitably be ascribed to a misguided sense of loyalty on the part of the staff towards the hospital) was seen to damage the contention which it was intended to fortify. For the rest, if our readers study the account of Mrs. Heafield's successful claim, they will find their own opportunities for

comparing what was done or left undone with the best modern practice of hospital hygiene and administration. The trial is over. The crippled plaintiff would sooner have the health which she has lost than a heavy award of damages. Money cannot compensate her. The essential task now is for all hospitals and maternity homes to take such steps as will prevent the recurrence of any similar verdict. They have had two impressive warnings in a twelvemonth.

THE RÔLE OF THE ARTERY

How the blood flows remains one of the most fascinating problems in physiology. HARVEY'S genius solved the main principle so completely as to postpone to our own generation the inquiry into the lesser difficulties, and there are still many points on which sages differ. Recent work suggests that the basic cardiac output is a body constant which is maintained almost at any cost. The combination of cardiac output and peripheral resistance constitutes the blood pressure. The heart, the arteries, and the arterioles are supplied by the autonomic nerves. The capillaries, which are not under nervous control, can contract independently, and they dilate in response to the "H" substance of LEWIS (1928).

It is now generally held that with a normal cardiac output the blood pressure is maintained by the arterioles, and that variations in blood pressure are effected by the autonomic nerves. Whether this is the whole story is doubtful. Certainly in conditions of sympathetic overactivity, such as Graves's disease or following the injection of adrenaline, no rise in the diastolic pressure occurs comparable to that of essential hypertension. In fact the diastolic pressure usually changes but little. It may be that a chemical agent is responsible for the basic pressure, and that the sympathetic nerves only effect those quick changes in pressure as are required by alterations in the environment. The discovery of such an agent would throw light upon the curious problem of hypertension. The blood pressure falls in some conditions associated with acute weakness of the left ventricle. Thus a fall occurs in the early stages of a coronary thrombosis, in diphtheritic myocarditis, in some cases of paroxysmal tachycardia where the rapid cardiac action and the shortened diastole cause weakness of beat, and sometimes in hypertension with the onset of failure with congestion. But here too the issues are not altogether clear. In diphtheria there is evidence that this drop in the blood pressure is accompanied by signs of stagnation of the blood in the capillary zone—a form of peripheral failure which may aggravate the cardiac weakness by reason of the diminished venous return. A large element of shock may also be present during the initial phase of a coronary thrombosis, although the fall in pressure is probably beneficial. In paroxysmal tachycardia the cardiac output is known to fall. In only a small proportion of patients with hypertension does the pressure fall materially with the onset of failure. In these one must suppose that the labouring heart is unable longer to keep up the output, and that the drop in pressure is of central origin.

The function of the large elastic arteries is to receive the blood ejected by the heart during systole, and to convert the intermittent cardiac output into a constant capillary flow. The muscular arteries, through the agency of the autonomic nerves, distribute the blood in accordance with the requirements of the different organs. According to LEWIS (1928) a fine control is effected by the capillaries, which by their contraction prevent more blood from passing than is needed. It has often been suggested, and recently by WYBAUW,[1] that the arteries possess powers of rhythmical contraction. Normally their rhythms would be dominated by the superior rhythm of the cardiac centres, but though latent it is claimed to be present in a similar manner to that of the auriculoventricular node. The evidence for this view is derived mainly from the secondary pre-anacrotic and dicrotic waves which can be seen in pulse tracings, and have been held to be due to independent contractions of the arterial wall. In his Lumleian lectures, publication of which is completed in our present issue, Dr. CRIGHTON BRAMWELL considers this problem as it concerns the pulse. He shows that all secondary pulse-waves can be reproduced and studied in a water-filled tyre. Pre-anacrotic and dicrotic waves are actually caused by daughter waves of the main wave, and are comparable to the breakers of the incoming tide. On the seashore the steeper the wave the more imposing is the crash as it breaks, and the larger are the daughter waves into which it divides. In the case of the pulse-wave the steepness of the wave depends upon the stroke volume of the ventricle and the rate of ejection of its contents. Thus secondary waves are prominent in free aortic regurgitation with a low diastolic pressure. To the steepness of the wave, too, is due the water-hammer pulse of aortic regurgitation. This is found to a less degree in hyperthyroidism and profound anæmia, in which the rate of ejection is also quick. To the same factor can be ascribed the third phase of the loud cracking sounds described by KOROTKOW when the artery is compressed by the sphygmomanometer armlet. Secondary waves were found to disappear when the fourth phase of muffled sounds ensued, and there was a close correlation between the diastolic pressure obtained by observing the point at which these sounds went and that obtained by auscultation. The fact that sounds may persist down to zero in aortic regurgitation, and sometimes in hyperthyroidism, is explained by the fact that in these conditions the pulse-wave is naturally steep, without the intervention of the compressing armlet; the persisting sounds have a similar basis to the water-hammer pulse. Steep waves also cause loud sounds. Thus the Korotkow sounds are loud in aortic regurgitation and faint in aortic stenosis.

The evidence against rhythmic arterial contractions thus seems to be considerably more cogent

[1] Wybauw, R., *Scalpel*, April 17th, 1937, p. 486.

than that in its favour. In addition Dr. BRAMWELL'S work offers a ready and acceptable explanation for some features in blood-pressure readings which have hitherto seemed rather mysterious.

CONFLICTING PICTURES

Dr. H. G. DAIN, who conducted the case for the British Medical Association at the court of inquiry last May, described himself at the Belfast annual meeting of the Association as a disappointed man. He was referring in the first instance to his failure to convince the court of the need for an increase in the capitation fee. But apart from this failure he was distressed at what he felt was the distorted picture of insurance practice given by officers of the Ministry of Health. The evidence of the two regional medical officers, if it was taken to reflect actual conditions in practice, was, he said, most damaging to the profession's case. The idea of the Ministry seemed to be to depreciate the service which insurance practitioners rendered, in order that the Ministry might secure it at the cheapest possible price. On another page we set out the two pictures given on the one hand by medical officers of the Ministry formerly in insurance practice, and on the other by Dr. D. G. GREENFIELD, who was called with the permission of the chairman to present to the court the experience of a doctor actually in insurance practice now. Dr. GREENFIELD'S evidence was given impromptu. What he said was his immediate reaction to what had gone before and no doubt with more time to consider in detail the arguments of the regional medical officers it would have been easier to combat them effectively. To take only a few examples: the so-called "most modern treatment" for gastric ulcer by injection of histidine had already fallen into disuse by the time the evidence was given, and this may apply to some of the other unspecified methods which are held to have lessened the practitioner's work. The experience of Dr. MACKENNA that antenatal examination is seldom called for by insured persons, or that of Dr. HARVEY that this is done by doctors at clinics, can hardly survive the Midwives Act of 1936. Dr. GREENFIELD'S evidence of increase of time spent in surgery hours is impressive; his most cogent point however was that for certain pathological conditions such as varicose veins whereas it was formerly the custom to ring the changes by ordering certain lines of treatment without applying any of these personally, now the whole of the treatment must be carried out by the practitioner himself. He contested the alleged rarity of cases of severe anæmia and diabetes, pointing out that many patients who would formerly have died within a year or two of the onset of their disease would now remain under treatment for many years. It would be instructive to learn the experience of doctors in other types of practice.

ANNOTATIONS

LONDON SCHOOL-CHILDREN

IN his annual report as school medical officer for the county of London Sir Frederick Menzies welcomes the new wave of interest and the fresh urge with regard to the children's health, which has expressed itself in anxious concern for their nutritional well-being, for the progress of physical culture and for improvement in environmental conditions both in and out of school. What the environment would be like if the Council for Art and Industry had its way is strikingly illustrated in the school designed for this council by Mr. Oliver Hill, F.R.I.B.A. All class-work is done at first-floor level for relief from noise. The south aspect, on which the class-rooms are found, consists entirely of windows opening on to a balcony. Staircases are replaced by gently sloping ramps. Besides the scholastic equipment there are milk dispensaries and lifts, spray and foot baths, drying rooms and covered playgrounds, and two rest-rooms adjoining a medical inspection room with bath and waiting-room. Careful clinical assessment at routine inspections, assisted by continuous growth charts, has codified the nutrition of 184,733 children as: excellent 17, normal 77, subnormal 5·9, pathological 0·07 per cent. These figures, very similar to those of last year, tend to be better in those who have been longer in school. The total number of children receiving milk from one source or other was estimated to be 315,000. The 11 nutrition centres are becoming loci of intensive study, such as the photometric investigation of vitamin-A deficiency. Although at the outset intended to be places of study and advice only, the physicians in charge of these centres have felt the need to prescribe when special deficiencies were diagnosed. The practice has therefore grown up of administering various inexpensive vitamin concentrates, and in cases of nutritional anæmia a simple iron preparation. Dr. L. W. Batten finds that in Paddington environment and way of life are more important causes of malnutrition than food. In Wapping Dr. A. C. M. Elman ascribes much of the trouble to deplorable housing—the economic factor is of great importance. Unlike Dr. Batten, he finds secondary (nutritional) anæmia common. The habitual posture of the children gives an important indication of the prevailing physical fitness and tone, as well as of the efficacy of the physical education, and Dr. Batten has made an attempt to grade the various conditions in a group of 674 children of various ages at 8 elementary schools, with results that are a good deal better than some of us would have feared. Posture on the whole is better in those about to leave school than in the entrants. The organisers of physical education cite the need for a wide variety of movements performed with a rhythmical swing to obtain reasonably supple bodies. Many abdominal exercises have been included in the syllabus. It is essential for the teacher to see the body of the child on which he is working, and one of the problems for the future is to provide the necessary shoes and clothing. Still one of the greatest causes of unfitness and invalidity is rheumatism. The scheme under Dr. C. E. Thornton is providing prolonged rest and care in the early stages with a view of minimising the risk of permanent cardiac crippling. Accommodation for rheumatism and chorea is provided at Queen Mary's, Carshalton, High Wood Hospital, the Downs Hospital near Sutton, the Lower Southern Hospital and Norwood Children's Hospital, 910 beds in all, which proved on the average just adequate for the needs. While the children are

away care committees inquire into their home conditions. Onset of cardiac damage is unfortunately so insidious that some evidence of involvement was already present in 38 per cent. of cases on admission. The results on discharge in 1900 cases were in percentages: Fit for ordinary school or any job, 79; fit for special P.D. schools, 12; fit for light work only, 6; unfit for any school or work, 3. Many indications suggest that without the provisions of this scheme the number of cardiac cripples would have been much greater.

AIR EMBOLISM AFTER ABORTION

THE question of death from air embolism, which comes up periodically for debate and seldom elicits a decisive answer, has been reopened in Canada by Coles, Richardson, and Hall.[1] Noting the number of deaths attributed to air embolism following criminal abortion they have carried out experiments to find how much air must be admitted into the circulation to kill an animal. They found, as did Joannides and Tsoulos[2] in 1930 and Harkins and Harmon[3] in 1934, that the amount was surprisingly large, being 6–8 c.cm. per kg. of body-weight in dogs, and they estimate that according to this it should take about 480 c.cm. to kill a human being. They are therefore sceptical about air embolism as a cause of death in the abortion cases, and they suggest what they think may be a more likely cause. In procuring abortion vaginal douches containing chemical substances are commonly used, and they point out that if it is possible for air to enter the uterine sinuses by aspiration it must also be possible for fluid to enter and cause death by poisoning. They investigated the toxicity of some of the fluids commonly used, including commercial phenol preparations, sodium and potassium soaps, potassium permanganate, and bichloride of mercury when injected intravenously into rabbits and they found that these, particularly the soaps, were fatal in much smaller quantities than was air. They suggest therefore that in cases of death following criminal abortion, which show air in the heart and veins post mortem, some possible cause of death other than the air should be considered. Such cases always present difficulties, especially as there is usually infection, and often infection with gas-forming organisms which are themselves capable of producing in the veins an appearance not unlike that seen with air embolism.

TOXIC EFFECTS OF VASOPRESSIN IN ANIMALS

ATTEMPTS to relate the eclamptic toxæmias of pregnancy to overactivity of the posterior lobe of the pituitary have so far met with very little success. One of the most obvious ways of testing the hypothesis is to attempt to reproduce the symptoms and lesions of eclampsia in animals by injecting vasopressin. Some years ago Fauvet[4] claimed to have done so, but Ohligmacher[5] was unable to confirm his findings. In an attempt to decide the question Dr. Byrom[6] has been re-examining the effect of vasopressin on rats. He reports that if large enough doses of the hormone are injected gross lesions appear in various tissues. The most striking changes are found in the kidneys. About half an hour after an injection of 40 units of vasopressin these organs display large irregular areas of pallor, which later acquire the characters of anæmic arterial infarcts and are clearly due to spasm of isolated branches of the renal arteries. When smaller doses are given repeatedly for several days, a less intense and more diffuse kind of lesion is found, presumably of similar origin, which is characterised by albuminous, dropsical, or fatty degeneration of the convoluted tubules, with little or no necrosis—an appearance closely resembling the changes found in eclampsia. Eclampsia is also suggested by the occasional appearance in the liver of focal necroses, which, however, lack certain features seen in eclampsia, and by the fact that in pregnant rats vasopressin causes death and maceration of the fœtuses. The parallel seems to lend some colour to the view that eclamptic lesions are expressions of vascular spasm. The dose needed to cause such lesions in animals, however, is so extremely large that Byrom finds it hard to believe that the spasm of eclampsia can be due to simple oversecretion of vasopressin, and he suggests that, if spasm is indeed concerned, it is perhaps, at least partly, due to some unknown factor that renders the vessels hypersensitive to pressor agents.

Apart from those mentioned above, Byrom describes other lesions that can be provoked by vasopressin. Large doses repeated at short intervals are followed by gross arterial lesions, especially in the kidney, which bear close comparison with the "necrotising arteritis" found in several human diseases, notably malignant hypertension. Focal glomerular necroses and intense hyaline-droplet degeneration of the renal tubules, also suggestive of malignant hypertension, are also occasionally found, and exceedingly large doses may give rise to the appearance of massive cortical necrosis of the kidney. It is interesting and possibly significant that both cortical necrosis and malignant hypertension are, like eclampsia, related ætiologically to pregnancy.

BEHAVIOUR AFTER EXTIRPATION OF FRONTAL LOBES

A PATIENT and detailed study of the behaviour and psychological changes in a man who had been operated upon for the removal of both frontal lobes for an extensive tumour has been made by Prof. R. M. Brickner.[1] It was concluded that no residual neoplasm having any neurological effects was likely to have remained behind. The method of observation was a day to day account of the life of the patient. Before the operation he was a normal man of business, 35 years of age, married, of equable temper, and of good intellectual capacity. The observations recorded in this minute study indicate not only a diminution of restraint, which one might expect from the removal of the inhibitory mechanisms which reside in the cortex, but the emergence of a pattern of behaviour which was a strange mixture of adult vocabulary, childish impulses, and self-feeling. He became a braggart in word but not in deed, and although there was a marked tendency towards aggressive reactions, these were mainly expressed in words and rarely went beyond a certain measure of half-restrained horseplay. Childish forms of behaviour were illustrated by the free use of neologisms derived from infantile expressions and jokes, and a facetious display of an adolescent type. His sexual life would appear previously to have been uneventful; he now indulged in innuendoes

[1] Coles, B. C., Richardson, H. F., and Hall, G. E., *Canad. med. Ass. J.* July, 1937, p. 24; Richardson, H. F., Coles, B. C., and Hall, G. E., *Ibid*, 1937, **36**, 584.
[2] Joannides, M., and Tsoulos, G. D., *Arch. Surg.* 1930, **21**, 333.
[3] Harkins, H. N., and Harmon, P. H., *Proc. Soc. exp. Biol., N.Y.* 1934, **32**, 178.
[4] Fauvet, E., *Klin. Wschr.* 1931, **10**, 2125.
[5] Ohligmacher, H., *Ibid*, 1933, **12**, 1404.
[6] Byrom, F. B., *J. Path. Bact.* 1937, **45**, 1.

[1] The Intellectual Functions of the Frontal Lobes. By Richard M. Brickner, B.S., M.D., Assistant Professor of Neurology, College of Physicians and Surgeons; Attending Neurologist, Neurological Institute, New York. London: Macmillan and Co. Pp. 354. 15s.

suggesting the resurgence of sexual tendencies. In regard to mental synthesis, he now showed an inability to deal with complex situations, born largely of a tendency to digression and to flight of ideas. There does not appear to have been any gross break-down in his power of synthesis. His difficulty in isolating mental elements for the purpose of concentrating on a situation, or segregating, as Prof. Brickner calls it, appears to be due to a hypomanic tendency rather than to destruction of intellectual processes. Mental tests indicated an appreciable intellectual impairment, giving an intelligence quotient of 80 on the Terman test and a lower quotient still on performance tests. In the language of engrammic psychology, it might be said that while individual engrams remained intact there was a distinct loss of the power to integrate them into larger engrammic patterns, which the highest forms of mental synthesis require. Hughlings Jackson's dictum of dissolution seems to be corroborated in this case, and the partial dissolution of purposefulness fits in with the thesis put forward by Goldstein and Schilder. Unilateral lesions of the frontal association areas do not produce anything like the same deterioration in mental function.

This valuable study goes to confirm the fact that no adequate tests are yet available for the study of mental synthesis on the higher levels. For in this case the mood changes which have followed the operation illustrate that effective factors, hitherto held in check, play no mean part in the lowered capacity for synthesis and segregation. The book is therefore not only of value as a detailed study of a lobectomised subject, but it brings out the fact that tests remain still to be devised for estimating the significance of the frontal lobes as a special region in the implementing of the intellectual life.

EXTRAPLEURAL PNEUMOTHORAX

THERE have been many developments in collapse therapy of the diseased lung in cases of phthisis since the inception of the artificial pneumothorax many years ago. At first, it was the aim of the phthisiologist to obtain a complete collapse of the lung no matter how restricted in extent was the lesion; in this he was often defeated by an adhering pleura, too often over that very part of the lung that he wished to free. Phrenic avulsion and internal pneumolysis assisted in converting an inadequate pneumothorax into a satisfactory collapse. What the artificial pneumothorax was able to accomplish in the acute early case the thoracoplasty was devised to imitate for the fibrotic cavernous lesion of chronic phthisis; to obtain, on the radiogram, a narrow slit between the lateral thoracic wall and the mediastinum, from apex to base, was the ambition of the thoracic surgeon. The introduction of the bilateral pneumothorax opened the eyes of the physician to the possibility of selective collapse. The physiological requirements of respiration would not permit of anything approaching a complete collapse of both lungs, but it became apparent that the diseased apex displayed a greater tendency to relax than the healthy lower lobes. Selective collapse in unilateral cases was regarded as a fluke, incapable of exact control, until Maurer succeeded in fixing the pleuræ at will with 50 per cent. glucose solution. The thoracic surgeon was not long behind the physician in applying the principle of selective collapse. The apical thoracoplasty was substituted for the complete paravertebral thoracoplasty of Sauerbruch, while apicolysis with paraffin plombage has been in use for over 20 years. In this last operation wax has enjoyed the longest vogue of any substance as a medium to maintain the collapse, as it can be easily moulded to fit the confines of the dead space; but it has the drawback of being a foreign body, and is treated as such, being eventually extruded piecemeal by the host. It enjoyed popularity for a time, as its limited rib resection entailed little shock to an ill or emaciated patient; but the end-results were often unsatisfactory, inelegant and, in many cases, positively harmful. Gravesen, therefore, devised the partial thoracoplasty combined with apicolysis. The parietal pleura was stripped and the apex of the lung drawn down; this was followed by an upper 4 or 5 rib thoracoplasty. The immediate partial collapse was excellent, but there was a tendency for the lung to re-expand, in some cases allowing the cavity to reopen. The final contribution towards attaining a selective concentric collapse by surgical means was the thoracoplasty with extrafascial apicolysis by Semb and Holst.

Despite the advance in the technique of the surgical approach to pulmonary tuberculosis there still exists a big gap between the relatively benign artificial pneumothorax, with its satellite operations, and the major operation of thoracoplasty—an irrevocable procedure attended by risk of shock, hæmorrhage and infection. Moreover, there is a group of cases with moderately early disease in which an artificial pneumothorax is a mechanical impossibility and for which, because the disease is still active and unstabilised, thoracoplasty is unsuitable. It is the patients of this group that will benefit from an extrapleural pneumothorax described on p. 377 by Dr. Brian Rhodes. As a method of obtaining collapse it is not original, but it has recently been revived on the continent by Graf and Schmidt. Dr. Rhodes gives an eye-witness's account of the procedure as he has seen it performed in these two clinics at Coswig and Heidelberg. The pneumothorax is induced with local anæsthetic with the patient sitting. A short length of the third rib is resected through a paravertebral incision and the corresponding intercostal nerve divided. The parietal pleura is identified, and is gently separated from the endothoracic fascia with the finger-tips or a blunted holder. Pneumolysis can be carried as far as is desired over the cupola of the lung and down over the mediastinal surface to the root. This last manœuvre is important if selective concentric collapse is to be achieved. The stripping is performed under direct vision with the aid of a small lamp within the chest and any bleeding (and there appears to be very little) can be swiftly controlled. Once the lung has been freed there are two courses open to the operator; either to sew up tightly so as to make the dead space airworthy or to leave in the wound a small catheter, attached to a manometer, so as to maintain a zero pressure for 24–36 hours. On general principles the first method seems the wiser, as it reduces the risk of infection. Moreover, an effusion of blood and serum to excess can be easily aspirated and replaced with air in the usual way. It would, perhaps, be prudent to have a pneumothorax needle ready at hand should a spontaneous pneumothorax occur, although according to Dr. Rhodes this is a rare event. Once the induction has been accomplished the extrapleural pneumothorax is maintained along lines exactly similar to the intrapleural pneumothorax. The manometric readings show less variation in inspiration and expiration, and the amount of air required at each refill is less, being seldom more than 200 c.cm. Should obliterative pleurisy occur—and this has happened quite often—the pneumothorax

can be replaced with an extrapleural oleothorax. It is wise, as Dr. Rhodes points out, to allow an interval to elapse between the induction of the pneumothorax and its conversion into an oleothorax, to ensure a stiffening of the walls of the space. By such means is perforation of lung avoided.

Two French observers, with similar opportunities of seeing the German work, have been proving the method at the Hôpital Laennec and several Paris sanatoriums, reaching the same tentative conclusions.[1] Because the extrapleural pneumothorax would seem to be a rational method of dealing with a certain group of cases that are denied collapse therapy at the present time; because it is a less drastic and less mutilating procedure than thoracoplasty, and is, in no sense, a permanent collapse, we endorse Dr. Rhodes's statement that it is a method deserving of more extended trial.

METALLIC SALTS AND HORMONES

SALTS of zinc are known to prolong the action of certain hormones and other potent organic substances such as diphtheria toxin and histamine. In our last issue Prof. E. C. Dodds and his co-workers showed that the antidiuretic action of posterior pituitary extract is also prolonged by salts of zinc, and still more by salts of cadmium and nickel. The mechanism of this prolongation can hardly be a chemical union with substances of such widely varied constitution; it is more likely, he thinks, that the metal alters absorption from the site of injection. Investigations into the effect of zinc and allied metals in prolonging insulin hypoglycæmia have been made in the pharmacological laboratory of Boots Pure Drug Co. and were reported by E. M. Bavin and W. A. Broom at the recent Liverpool meeting of the British Pharmaceutical Congress. The mammalian pancreas contains small but definite amounts of zinc and this metal is an essential constituent of crystalline insulin. Whereas small concentrations of zinc produce a prolongation of hypoglycæmia, complete inhibition of the normal insulin response results, it seems, if the amount of metal present is increased. The prolongation of insulin hypoglycæmia caused by traces of certain metals is thus the initial stage of an inhibitory effect which becomes virtually complete with large concentrations. The mechanism of this inhibition is discussed by the authors. Neglecting the theory that the metal may produce hyperglycæmia, which in the case of zinc has been negatived, they suggest two possible explanations. In the first place, the metal may attach itself to the active groups of the insulin molecule and thus render it incapable of producing its normal response; or the metals in the rather large concentrations used may exert a toxic effect on some stage of carbohydrate metabolism and thus inhibit the course of events which normally follows the injection of insulin. The necessity for the presence of zinc in the formation of crystalline insulin and its effect in increasing the action of protamine insulin lend colour to the hypothesis that zinc can combine with the insulin molecule, and hence give support to the first of the above suggestions. In such a case, however, it would be expected that, the smaller the atomic weight of the metal used, the smaller would be the concentration necessary to produce inhibition, whereas a greater concentration of magnesium is necessary than is the case with zinc. The same authors have confirmed the observation of Bischoff and Gray that tannic acid also prolongs the hypoglycæmic action of insulin and have shown that the addition of zinc to the tannic-acid insulin complex still further prolongs the hypoglycæmia. Suspensions of tannic acid, insulin, and zinc with a tannic-acid insulin ratio of 2 to 1 have been shown to produce a hypoglycæmia as prolonged as that produced by suspensions of protamine, insulin, and zinc. The evidence certainly encourages a clinical trial of tannic acid and insulin in the ratio of 2 to 1 with the addition of 1 mg. of zinc to each 500 units of insulin.

[1] Hautefeuille, E., and Dreyfus-le Foyer, *Presse méd.* June 9th, 1937, p. 859.

SILICOSIS HAZARDS AMONGST METAL POLISHERS

A STUDY of the silicosis hazards of metal polishers is recorded in the *Industrial Bulletin* for June, 1937 (p. 227), published by the Industrial Commissioner of New York State. Dr. Adelaide R. Siviter states that tripoli is the only siliceous substance to which polishers are exposed, and that in this industry it is so used, incorporated in a greasy medium, as to reduce materially its dustiness; and that the recent investigations which indicate a slight silicosis risk amongst metal polishers appear quite consistent with the known facts. A group of 80 men were examined, of whom 73 had been employed for over 5 years and 43 for over 15 years at metal polishing. Out of the whole group "two, or 2·5 per cent., showed silicosis . . . characterised by a fine type of mottling." Neither had worked at any other trade: 47 (58 per cent.) showed "increased fibrosis" (12 of whom presented evidence of old healed tuberculous nodules). In all 16 per cent. of the whole group showed evidence of healed tuberculosis. Dr. Siviter quotes for comparison a study of dust in a silverware plant, published in a *Public Health Bulletin* (No. 208) in 1933, in which 70 per cent. of 51 men showed X ray evidence of increased fibrosis. It would appear to us more important to inquire into the causes and significance of the high proportion of men showing "increased fibrosis" than to direct attention to the low incidence of frank silicosis in this occupation. It would be of interest to learn what grounds Dr. Siviter has for the opinion that the "rather high incidence of increased fibrosis . . . is probably of little clinical significance." Ought not its significance to be related to the figures which she quotes earlier in her paper, where she points out that, according to figures derived from statistics compiled by the Registrar-General, the mortality amongst metal polishers from tuberculosis and bronchitis is twice the standard rate for all occupied and retired males?

"SABOTAGE" IN THE BACTERIOLOGICAL LABORATORY

THE careful bacteriologist when he finds some precious subculture which he has laid by with all precautions has become contaminated with moulds must sometimes give way to the thought that some perverse and mischievous agency has been at work. Dorothy Pease of the botany laboratory, Columbia University, makes some interesting suggestions[1] as to how this contamination may sometimes come about, ascribing it to the activities of mites such as tyroglyphidæ. Some of these mites may feed and breed under the thick mycelium of moulds. They will travel from culture to culture carrying conidia and bacteria on the surface of their bodies and leaving them in their wake. They can easily invade Petri dishes but they can also find their way through the cotton-wool plugs of culture tubes and they have

[1] *J. Bact.* 1937, **33**, 619.

even been found at work in tubes capped with tinfoil tightly bound down by rubber bands. Cockroaches and flies which are extensively parasitised by tyroglyphidæ are a potential focus of spread and even the young cockroaches themselves may enter Petri dishes spreading ruin among pure cultures. Acarines of the "wood lice" type are probably of particular importance owing to their great numbers and wide distribution. Their imagos are about 0·5 mm. in length, but their three-legged larvæ are so small as to be hardly visible without the aid of a magnifying glass. Pease describes how on one occasion in her laboratory mites found their way into a "dust-proof" cabinet where all the stock cultures were kept and travelled from tube to tube carrying actinomyces and foreign bacteria into most of the tubes. According to Puntoni [2] these little pests may be guilty at times of even more dangerous tricks. He records an apparent return of virulence in cultures of B C G which was found to be due to a contamination by virulent tubercle bacilli carried from neighbouring culture tubes by mites. Possibly the matter is of more moment in warmer climates than ours, but when we hear of "sabotage" in the bacteriological laboratory we should perhaps give a thought to the possibility that mites may be the villains of the piece.

TAR OR JUST DUST?

THE dust from tarred roads has frequently been cited as a probable cause of the increase in lung cancers in recent years, and reference was made some weeks ago[3] in our columns to the work of Dr. J. Argyll Campbell which seems to support the idea. Campbell showed that exposing mice to an atmosphere laden with road dust containing 2–3 per cent. of tar produced cancer of the skin in a large percentage of the animals which survived sufficiently long and also increased tenfold the incidence of a lung tumour to which they were prone. In order to determine the part played by the tar as distinct from the dust, Campbell has repeated his experiments,[4] using the same dust after removal of the tar by benzene. As in the previous experiments the mice were exposed at hourly intervals, for a year or more, to clouds of dust such as arise from dusty roads. With the tar-free dust no skin tumours were produced, while the incidence of lung tumours was considerably lower than in the previous experiment. Amongst the animals living ten months or over only 45 per cent. showed lung tumours with the tar-free dust, whereas 74 per cent. produced them when tar was present. This would seem to indicate that tar may be an important factor in the development of lung cancer, but it should be noted that the mice used in these experiments were naturally liable to develop lung tumours, sometimes as many as 20 per cent. of the controls showing them. In this respect the experiments are perhaps not very striking, but Campbell has pointed out that the tar-laden dust not only increased the numbers of mice affected but increased the numbers of tumours in individual mice and in addition produced malignant changes in a considerable number. Three of his mice showed metastases in liver or kidneys. His experiments seem to show clearly enough that inhaled tar may act as a carcinogenic agent in the lungs and he is a convinced supporter of the road-dust theory. A final conclusion in this problem is, however, difficult to arrive at, for as several writers have shown, lung tumours seem to be increasing appreciably in countries where there are few tarred roads, so that if tar is a contributing factor it is presumably not an essential one. There are indeed a number of authorities who have yet to be convinced that the apparent increase in these tumours is a real one.

[2] *Bull. e. Att. R. Acad. Med. Roma*, 1931, **57**, 300.
[3] *Lancet*, 1937, **1**, 1291.
[4] *Brit. J. exp. Path.* 1937, **18**, 215.

PERMANENT DIABETES INDUCED BY HORMONE INJECTIONS

Dr. F. G. Young, whose clear exposition of the complex subject of carbohydrate metabolism was published in our columns last year,[1] has since joined the staff of the National Institute for Medical Research at Hampstead. He has continued there experiments on the relation of the pituitary gland to carbohydrate metabolism and reports on p. 372 an important new fact. Several observers have maintained that the administration of anterior pituitary extracts to animals may lead to the appearance of symptoms of diabetes mellitus, but these have only been transitory. Dr. Young has managed, as a result of the daily injection in large doses of extract freshly prepared from the anterior pituitary gland of the ox, to induce a permanent diabetic condition in two dogs. This is the first time that a permanent diabetic condition has been produced experimentally without surgical interference with the pancreas. The diabetes produced in this manner differed from that of depancreatised dogs in that the dogs injected with pituitary extract appear to be able to survive indefinitely without insulin, in a vigorous condition; one of them did not lose weight. One of the animals treated experimentally with insulin required 60 units (4·4 units per kilogramme of body-weight) daily to keep the urine almost free from glucose on a normal diet. Dr. Young is now investigating the nature of the differences between depancreatised dogs and those subjected to injections of pituitary extract. The condition of the islets of Langerhans in the latter is being examined and the question whether the insulin requirements of these animals is significantly greater in that of depancreatised dogs is being ascertained by direct comparison under similar conditions.

[1] *Lancet*, 1936, **2**, 237 and 297.

INDEX TO "THE LANCET," VOL. I, 1937

THE Index and Title-page of Vol. I, 1937, which was completed with the issue of June 26th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NEW MATERNITY CENTRE AT WESTMINSTER.—The new maternity and child welfare centre and day nursery situated at the corner of Bessborough-street and Lupus-street, Westminster, will be finished and opened in the early autumn. The basements include a laundry and perambulator store. On the ground floor, which is to be administered by the health committee of the city council, are rooms for a medical officer and health visitors, weighing and demonstration rooms, and accommodation for an antenatal clinic. In the corner of the waiting-room is a separate room for babies suspected of suffering from infectious diseases. The first, second, and top floors are to be rented by the Westminster day nursery committee, and will have sun rooms and wards where mothers, attending hospitals for in-patient treatment or actresses temporarily out of London, may leave their children.

PANEL AND CONTRACT PRACTICE

INSURANCE PRACTICE TO-DAY

TWO DIFFERENT PICTURES

THE court of inquiry held at the end of May to consider the capitation fee payable to medical practitioners under the National Health Insurance scheme was asked to take into consideration the nature of the services rendered to insurance patients. The Ministry of Health therefore invited two of its regional medical officers to give evidence in what way recent advances in medicine had affected the scope and quality of insurance practice. Dr. D. L. Mackenna spoke from his own experience of a large mixed practice in the West of England and Dr. F. J. Harvey also from his personal experience with a mixed suburban type of practice. After they had spoken Dr. H. Guy Dain said that he would like to counter the picture of insurance practice which they had given, and with the permission of the chairman called Dr. D. G. Greenfield to present to the court the experience of a doctor actually in insurance practice now. By the courtesy of the British Medical Association we are able to give the contrasting pictures of insurance practice in the actual words in which the speakers addressed the court. The account is taken by permission from the shorthand notes of Messrs. G. Moore and Co., 38, Parliament-street, London.

DR. MACKENNA

I have been asked, as one who was in practice for a number of years, to come up and state whether, in my opinion, the recent advancements in medicine have added to or decreased the work of the panel practitioner. I was in practice in a large mixed practice in the West Midlands of England, and I had a panel of 1800 approximately. That formed less than one-third of my total practice. The class of patient I had was the collier and steel worker, with a large number of farm labourers. It was situated 17 miles from the nearest general hospital. I have heard all the evidence of the British Medical Association, and their memorandum has been handed to me for my comments. Of course it is understood that I can only deal with the medical points raised. I would say also that I have been, apart from the years of the war, in practice for 24 years, that period terminating during 1934, and I joined the regional medical staff of the Ministry of Health in 1935.

Up to that time, when a patient came to me I asked myself the question: How does this man differ from the normal individual? and I decided that question by the ordinary physical examination which was open to me. It was only in prolonged obscure cases that I had to send the patient to hospital for advanced methods of diagnosis. There are very few general practitioners who have the skill or the apparatus which is necessary for these more modern and advanced methods. Very few doctors have the apparatus, and if they have the apparatus, unless they are doing these special investigations constantly and regularly, the opinions that they form from their readings are not accurate, to my mind; and it seems a waste of time for a general practitioner to embark upon them.

It has been suggested by the Insurance Acts Committee that there has been a considerable increase in the number of persons who come to consult their doctor or to ask advice as to how to keep well. It might be called preventive medicine. It was my experience in practice that it seldom or never happened, and in the whole 24 years I was in practice, I can only remember three healthy people coming to me and asking for such advice. Certainly boys and girls between the ages of 14 and 16, when they are getting away from their mothers' apron-strings, never came and asked for advice; they only came to see me when they were ill. The same thing applied to the ordinary adult population.

Of course it has always been the duty of a practitioner to advise in the early stages of disease, in order that a more serious condition might be prevented from arising. But the necessity for that, I am perfectly confident, is no more to-day than it was in 1924. The Insurance Acts Committee state that there has been an improvement in and an elaboration of method in diagnosis and treatment. No one is going to deny that at all; we all know it; but I maintain that these methods of diagnosis are mainly confined to the domain of the specialist and do not concern the general practitioner and do not add to his work. I also maintain that these methods of diagnosis and treatment not only reduce the work of the doctor, but they also reduce his responsibility.

The Insurance Acts Committee instanced the case of the diagnosis and treatment of pernicious anæmia. I would say that in the average practice, and certainly in mine—and I think mine was typical of the average type of practice—the number of cases of pernicious anæmia which any doctor is called upon to treat is very very small. In 24 years' practice I can only remember having to treat six cases. Now the proper diagnosis of pernicious anæmia can only be done efficiently, in my opinion, by one who possesses the necessary apparatus and skill. As far as the panel patient is concerned, the diagnosis as a general rule is carried out in hospital, where there is a specialist who does practically nothing else but these scientific investigations. In the old days, before these methods were introduced, the general practitioner would go on treating these cases, but had no means of definitely making up his mind whether it was a case of pernicious anæmia or not; he had to go on seeing that patient week after week; whereas now, as soon as he suspects a case—provided he has the interest of his patient at heart, which we know that all doctors have—he immediately sends that patient to hospital for a definite diagnosis, and the specialist sends back to the doctor a report. He advises the doctor how to treat that patient, the exact amount of dosage of Liveroid, and the responsibility for the treatment and the supervision of the patient to a large extent is taken out of the hands of the general practitioner. Periodically the general practitioner has to send the patient back for a blood count, and on the report of the specialist the dosage of liveroid is either increased or decreased. So, apart from writing the prescription, or, unless he adopts the method which I did of giving it by injection, he has only got the trouble of writing a prescription.

The British Medical Association has said that many of these modern methods are laborious. If the treatment entails a hypodermic injection, I do not think there is much labour about it; certainly not in a properly regulated practice; because it should not take long to give the treatment. These cases of pernicious anæmia, by means of the modern method of treatment, get better. I have cases of patients in my memory who were very very ill when I was first called in, but made a fairly rapid recovery and they are working to-day with only an occasional visit to

the hospital to have the blood examined. The same thing applies to the treatment of simple anæmia. When I started in practice in 1910 in a large industrial centre, I had a great many cases of what was then called simple anæmia, and they used to come week after week. Nowadays, anæmias are differentiated one from the other by means of a specialist, who examines them and informs the doctor of the exact diagnosis. The ordinary simple anæmia is now cured very rapidly by massive doses of iron and this lessens the work of the practitioner.

The question of gastric ulcers has been raised. I think a good deal of the alleged increase is simply due to the fact that there are better means of diagnosis. As Dr. Paterson has said, in the early days the doctors were crowded out with patients suffering from dyspepsia and the doctors had no means of telling definitely whether the man had a gastric ulcer or not. By using the X ray the diagnosis can be made definitely, and efficient treatment can be carried out at a much earlier date. If it is decided that the treatment should be surgical, then, owing to the improved technique in the operation, it is my experience that patients operated on in recent years have fewer sequelæ than those patients who were operated on for a similar condition 10 to 15 years ago. I have had patients who have had the operation, and it was very marked that in recent years the sequelæ were fewer. The most modern treatment by the injection of histidine I have no experience of at all, but I have been informed by a specialist that by the adoption of this method the duration of the condition is shortened and the patient gets back to work very rapidly and, with an annual overhaul, can be kept well I am perfectly certain that the modern methods of treatment have definitely lessened the work of the practitioner.

As regards the cases of neurosis which the B.M.A. mentions, I cannot speak of that type of neurosis. In my practice the peak of the neurosis was just after the war, about 1922 or 1923, and it never impressed me that in the later years of my practice there was any notable increase. But I agree that the treatment of the serious cases of neurosis is not the work of the general practitioner. He has not the time or the knowledge. The treatment of those cases is definitely that of the specialist.

Dr. Paterson has dealt with the question of the sphygmomanometer. The Insurance Acts Committee suggest that this is a new instrument which has come into being since 1924; but I have been using it ever since the war in my practice, wherever I considered it necessary, and it does not take up much time.

As to sera and vaccines, I take it that the B.M.A. also claim there has been a big increase in the use of these in 1936 compared with 1924. I disagree with that. In my experience—and I think it is pretty generally accepted—vaccines are not used so frequently now as they were in 1924. It was a fashionable thing in 1924 to use a vaccine for everything, but from experience it was found, I think—and it certainly was my experience—that the results obtained were not nearly so good as were expected. In fact I finally gave up the use of vaccines in most cases. But if they are used, surely they are used to get the patient better quicker than by ordinary medicinal means. If they effect the purpose for which they are intended, surely it must mean that the doctor has less work to do in those particular cases. Otherwise, why use them? The same thing applies to the sclerosing methods in the treatment of varicose veins. Here I think the doctors will admit that the results are astonishingly good and patients get better much more quickly than under the old treatment, and with less time taken in treating that particular type of disease.

Then as to the use of other dressings—elastic adhesive dressing and oxide of zinc strapping—they certainly relieve the doctor of frequent dressings and facilitate the recovery of the patient.

As to the collection of materials for bacteriological and biological examinations, I started doing them myself until I was stopped by the specialist, who said he would much rather do it himself at the hospital; and I think it is the experience of most doctors that the collection of these materials is done at the hospital by the hospital staff, so that it does not take up much of the panel practitioner's time.

On the question of antenatal examination, in my experience that is seldom called for by insured persons. That type of patient usually calls in the midwife or goes to the antenatal clinic. If she calls in the midwife, it is only if the midwife discovers anything abnormal that the panel practitioner is called in. My own experience was that I saw very very few cases of that type.

What I said about pernicious anæmia equally applies to the treatment of diabetes. The treatment is definitely under the control of the specialist. The specialist examines the blood and fixes the dose of insulin, and the insulin is not, as a general rule, administered by the doctor; it is done by the patient himself or by the district nurse. It was my experience that I very seldom had to give the insulin myself. I might have had to give it for about a week or so, until I had arranged for the district nurse to do so, or had educated the patient to do it. The only thing I had to do was to see that the patient went up to the specialist periodically, and I wrote the prescriptions for the insulin ordered by the specialist. I occasionally examined the urine. In recent years, in my experience, the district nurses are better trained than they used to be, and the doctors hand over to the nurses very much more work than they did 10 or 12 years ago, such as the dressing of wounds and things of that kind. This relieved me very considerably.

One very noticeable feature of my practice was that when the old-age pension for people of 65 came in, there was a very notable decrease in the amount of work which I had to do for patients between the ages of 65 and 70. Previous to the granting of the pension at that age, a great many of these people, though not organically ill, were yet physically incapable of sustained effort, in which case they got certificates of incapacity from me. As soon as the old-age pension was introduced, that class of patient ceased to come until he had got some definite illness. That resulted in quite an appreciable easement of my work.

In the rejoinder of the B.M.A. mention is made of the responsibility of diagnosing appendicitis as being no less than that of the responsibility of the operation. I think that is a debatable point. The doctor certainly has quite a lot of responsibility in diagnosing the case, but has the responsibility increased in 1936 from what it was in 1924? He has got, in my opinion, the same amount of responsibility in 1936 as he had in 1924, and it certainly has not increased. Now that he sends the patient to hospital so early, he is sharing the responsibility with someone else. His responsibility ceases as soon as he gets the patient into hospital. The hospital and the hospital surgeon then take the responsibility.

My opinion is perfectly unbiased in any way—I am here to give my honest opinion; that is, that in the later years of my practice the responsibility

was greatly lessened and the work was in many instances decreased. I think that probably the total amount of work has increased, but the type of case that I had to deal with was less severe than formerly. Patients were coming in at an earlier date and at an earlier stage of the disease. There was less responsibility and less arduous work attached. I had to treat all cases at home—I was 17 miles from the nearest hospital—of pneumonia and rheumatic fever. All I could do in obscure cases was to send them to hospital, if they could walk or sit—going by train—and have them X rayed. But I had to do the actual treatment myself, whereas in towns it is quite possible that a great number of these cases are treated in hospital.

DR. HARVEY

I was in general practice in a suburb of the city of Birmingham from September, 1920, until March, 1935. The practice was a mixed suburban practice and included a considerable proportion of insured patients. It is my experience that the science of pathology and morbid anatomy still form the basis on which the general practitioner bases his ultimate diagnosis, leaving the more intricate and detailed investigation in the hands of those in charge of the numerous hospital departments which are so well equipped to deal with them. Whilst it is still the primary duty of the panel doctor to arrive at a diagnosis and advise as to the treatment of disease, it is in the main the prerogative of the public health service to deal with its prevention and the adaptation of the individual to his environment. The occasions on which a healthy insured person came to consult me on the subject of how to keep fit were very few, and the amount of time involved was a negligible quantity. It was my experience that there was an increased tendency on the part of a patient to consult his doctor for minor departures from the normal. But this is probably offset by an increasing inclination of those in the towns to go into hospital for the treatment of the more serious forms of disease and to consult the specialist in the out-patient departments of those establishments, both voluntary and municipal, when they were suffering from ailments or disease requiring specialist diagnosis and investigation. The general practitioner is thus relieved from many visits in the more serious cases and from much anxiety and responsibility in general.

It is stated in the B.M.A. rejoinder that the responsibility for diagnosing a case of appendicitis at home and sending the patient to hospital is not less than that of operating in the hospital. I am afraid I cannot subscribe to that view. In my opinion, if the diagnosis is made at home and the patient is transferred to hospital, it is then surely the responsibility of the surgeon at the hospital to confirm that diagnosis or otherwise, and having confirmed it the responsibility for the operation then is his; and I submit that is a much greater responsibility than the one devolving on the panel practitioner of making a preliminary diagnosis.

As regards the improvement in the treatment of catarrhal conditions, I think that to a great extent the treatment is the domain of the hospital specialist. Certainly a large number of cases are sent to be investigated by the specialist. It was my experience in the later years in which I was in practice that most of the cases of serious illness did go into hospital; such cases as pneumonia and rheumatic fever were treated in the acute stages in hospital, and the more serious and complicated cases of fracture were usually sent to those institutions. This was particularly so where treatment in bed was necessary. It might be suggested that the transfer of a considerable proportion of the insured patients suffering from serious disease into hospital meant that the doctor was trying to get rid of some of his work; but in my opinion it is incumbent on the insurance practitioner to obtain for his insured patients that specialised form of nursing and treatment which he would get for his more wealthy patients and that can only be done by transferring these cases to hospital. It was always my privilege to exercise to the full my opportunities to advise in the early stages of disease when consulted by my patient. It is undoubted that there has been an improvement in and elaboration of the methods of diagnosis and treatment, but these methods of diagnosis are, generally speaking, confined to the domain of the hospital specialist, on whom falls, therefore, much of the responsibility and work which in former years devolved on the general practitioner. Such conditions as pernicious anæmia (which was referred to in the B.M.A. memorandum) were in my experience finally diagnosed in this way, and the modern method of treatment by its efficiency reduces the length of incapacity and the time taken in the treatment. The prescribing of liver extract or other suitable preparations cannot be said to be laborious, whilst the injection of campolon or other preparations, occurring as it does except in earlier stages at infrequent intervals, involves no great demand on the doctor's time. It would be agreed that cases of this nature are but infrequently met with, and the number that I personally had under my care were but few in the whole of my career as a panel doctor. The periodic control of the blood picture was invariably the responsibility of the hospital pathologist.

It is, I think, a fact that there has been an increase in the incidence of peptic ulcer during the past ten years, but it is probable that the increase is more apparent than real, in that by the modern method of diagnosis, which includes the use of X rays, cases which were overlooked in the past are now properly classified. Surgical treatment has advanced in its efficiency to a marked extent in recent years, and the results thus obtained, when taken in conjunction with those obtained by systematic dieting and the exhibition of the recognised medicinal preparations, have tended to minimise the extra call which the general practitioner would expect to find in this direction.

Reference is made in the B.M.A. statement to the use of the sphygmomanometer. This instrument has been in my possession and was used in the routine examination of my patients where required, both in their homes and in my surgery, since my earliest days in practice. The modern methods of treating varicose veins and ulceration is such that undoubtedly more time is spent in the actual treatment, but its efficiency is such that in most cases of varicose eczema and ulceration a considerable saving in attendance should result. I cannot call to memory that I was in the habit of using vaccines to any greater extent in 1934 than in 1924, and if the work in the surgery is properly organised the injection of such a preparation calls for no more time than is required to see a case which needs treatment by the more usual methods.

It was my experience, in the particular work in which I was engaged, that the number of confinements amongst my insured patients was considerably less in 1934 than in 1924, and I believe that my practice differed in no material respect from that of many others. The advent of the antenatal clinics was responsible for transferring a number of these cases amongst the poorer population into the care of the midwives. The antenatal work was done by the

doctors at the clinics and my services were only required in cases of abnormality or difficult labour. The work therefore which I was called upon to do under this heading was not great, and those cases which did come to me for advice and examination in this respect were those who placed themselves under my care for their confinements, and from whom I received a fee for attendance during labour and the puerperium.

I think it is undoubted that there has been some increase in the number of people suffering from minor nervous diseases. As regards the severer cases of psychoneurosis, I make no claim for proficiency myself in this respect. I think they call for more specialised treatment at the hands of a consultant of wide experience.

The collection of material for biological and bacteriological investigation called for but little of my time, and the nature of the specimens required to be obtained by me showed no marked increase in later years. Those required for special investigations were usually taken at the hospital.

There has been a reference to the ageing of the population. It is evident that the proportion of elderly people is increasing, and it was my experience in many cases that whereas these elderly people were regular attendants at the surgery, whilst in need of certificates of incapacity, on the attainment of the age of 65 their visits ceased, except on those occasions where treatment for some ailment was required. There was a noticeable reduction in the amount of work which I was called upon to do for this class of patient when the weekly certificate was no longer needed.

Those people who are suffering from diabetes and pernicious anæmia are enabled to live only because they receive continuous and active medical treatment, but the incidence of those conditions, even in a practice of considerable size, is so small that the work entailed cannot be considered as a major part of a doctor's duty. In those cases of diabetes which require the regular injection of insulin, the work devolving on the doctor calls for little consideration. The prescription of this preparation is done on an ordinary prescribing form and the injection is more frequently carried out by the patient or a nurse. Blood-sugar control is usually carried out at the hospital, and the periodical examination of the urine and an adjustment of the dietary are all that is usually required to be done by the doctor. These duties have fallen to his lot for many years.

I myself believe that there has been some increase in the demands made by the insured patient on his panel doctor during the period under review; but to offset this, there is, I am sure, a growing tendency for the more serious and, at the same time, more interesting cases to gravitate towards the large city hospitals. Encroachments by hospitals and by clinics set up by the local authorities were, in my later years of practice, causing serious alarm to many of us, and although it is generally admitted that such inroads on what had previously been the work of the general practitioner were having serious repercussions on the income from our private practice, it must be admitted at the same time that the effect on a panel practice was to lessen the volume of the work demanded, without any reduction in the remuneration received.

My remarks are based on my own experience in a town practice, where hospitals of every kind were available and ready to render any assistance required of them. Of the conditions which exist in a rural practice I have no qualification to speak.

DR. GREENFIELD

I have practised at Rushden, Northants, for 35 years. When the Insurance Act came in I was in practice by myself; now I have two partners. At that time my practice was about 2000. We have recently bought another practice, but for the last three years it has been approximately 3300 or 3400. When I was single-handed I estimate that my surgery hours were one and a half in the morning, with 2000 on the panel. Now there are three of us with a panel of 3300 and we have almost two hours a morning. On Dr. Harvey's evidence I can offer little remark, except to say that his practice is so different from mine that perhaps I had better say nothing. He says that all the serious cases of rheumatic fever, rheumatism, and so on went into hospital, but I do not suppose that I have sent rheumatic fever or pneumonia patients into hospital for the last five years—and I am a representative of a very considerable number of practitioners. For rheumatic and pneumonia cases I have no hospital provision whatever.

As regards clinics I have always understood that they are for the young people but the clinics do not enter into my practice, or not very much. I get a certain number of healthy young people coming to inquire what physical training they should undergo.

When Dr. Mackenna said he practised with a panel of 1500 I began to think I should have some means of comparing his practice with mine, but he detailed something that was much nearer the conditions of an earthly paradise than I have experience of; his conditions must be very different. Both witnesses have referred to varicose veins and said what they used to do. My experience differs entirely from theirs. The patients came to see us and we rang the changes on certain lines of treatment—we did not apply any of them actually—but now the whole of the treatment is carried out by ourselves. I am not one of those who encourage Sunday attendances at surgery, except for small operations like polypus in the nose, and so on; I suppose I have four or five people on Sunday mornings. But for three years we had roughly four or five people about the surgery for injection of varicose veins, because on the ordinary weekdays we had not room for those people to sit in the surgery and we had to take them on Sunday morning. It is contended that by this new treatment we have saved ourselves a lot of work. This may be so in ten years' time; my successor may be saved a good deal of work but it has saved me none. As regards the treatment of those people who are treated by injections, and then by the application of bandages: that requires time and patience, and the taking of them off in ten days' time also requires a good deal of patience, particularly on the part of the patient. All that treatment is carried out by us.

Then take pernicious anæmia; it has been asserted that this is a very rare disease. Actually we have nine cases under treatment at the present time. I cannot say what the experience of others is, that is our own. And it must not be assumed that these people go back to hospital after the diagnosis has been established by blood counts. The estimate of how the hæmoglobin is rising has to be pursued; we have done a considerable number of these blood counts ourselves. That probably takes an hour or an hour and a half. These people will remain, as far as I can see, under treatment for many years; formerly they died in a few years. In regard to diabetes the point is the same. It has been stated that diabetes is for the

expert. I do not agree. With a good general practitioner there is no need for an expert in most cases. The weekly visit to have the urine tested and to see about the diet is for the general practitioner. But it involves considerable extra work, especially with the young people. At the moment I have five or six of these cases.

On the question of gastric ulcers I should like to speak firmly. It has been assumed that surgery cures these people, and that we no longer need to bear responsibility for doing much more for them. I am sure that is not so. Dr. Hurst tells me that at the New Lodge Clinic more patients are admitted for the results of operation than for ulcer itself. To contend that surgical treatment is doing away with medical work is wrong. We have a considerable number of these people—probably more than 20. They are assumed to have an ulcer, and in nearly all cases there has to be an X ray examination. Do these people get away from us in six months or a year, not needing further treatment? No, they come up year after year. Some of them come continuously. All of them are frequent visitors to the surgery, and they have added much to our work.

Another question that has not been referred to is the use of the microscope. In the old days I took a microscope with me into practice and used it occasionally; my juniors use it a great many times a week.

I must say a word about old-age pensioners. I do not agree that pensioners do not come for certificates. They certainly do not come quite as often as they did, but many of them require a certificate for their club, and, acting on the advice of the British Medical Association, we give these old-age pensioners the certificates they require without charging a fee. And they still come to us for medical treatment.

And lastly, a word about antenatal treatment. I should say that 90 per cent. of expectant mothers in my practice come for antenatal examination. As for clinics, we have not got one. The work falls on us as it always has done, although midwives now attend many cases.

After-thoughts on the B.M.A. Meeting

THE Belfast meeting has inspired the *National Insurance Gazette* (July 29th) to hope that the medical profession may give effective help in solving some problems that still baffle national health insurance administrators. Our contemporary recognises that the British Medical Association is not only concerned with safeguarding the interests of practitioners but is a learned body, one of whose functions is to study scientific problems in a scientific way. One of these problems is created by the continued rise in the claims for sickness and disablement benefit. At one time the rise was hastily attributed by administrators to the carelessness or cowardice of the certifying practitioner, but it is now agreed that the subject cannot so summarily be dismissed. Incapacity for work is difficult to define, and, in many cases, difficult to recognise. It presents a complex problem, standing much in need of a more searching analysis than has yet been attempted. It involves difficult questions of industrial psychology. The certification of incapacity for work, in short, raises scientific problems that are still unsolved and need to be studied in a scientific way.

Similar problems arise from the continued increase in the cost of insurance prescribing. The high cost of 1934 was exceeded in 1935 to the extent of 1*d.* per insured person in England and of 1½*d.* in Wales, representing an increased expenditure of about £70,000. No one wants to deprive insured people of medicines that they need, but do they really need all that are prescribed for them? Oliver Wendell Holmes said that if the whole materia medica could be sunk to the bottom of the sea it would be all the better for mankind and all the worse for the sea, but he was not an experienced clinician. There must be few clinicians of long experience who would deny that the much-decried bottle of medicine has a place, and an important place, among the aids to the treatment of disease. But why should the annual cost of insurance prescribing vary from 54·7*d.* and 55·6*d.* per person in Manchester and Salford respectively to 27·8*d.* and 28*d.* in such reasonably comparable areas as Middlesbrough and Darlington? Here again are problems for the solution of which insurance administrators are entitled to look for effective help from the medical profession.

Our contemporary is concerned at the statement in Prof. Johnstone's presidential address that the general practitioner "must learn to make his diagnoses without the skilled help which the specialist commands, and to carry out his treatment with makeshift appliances and with amateur nursing," and expresses the opinion that the time has come for preparing a properly organised system in which such things as makeshift appliances would not be necessary. There are many who have come to hold that opinion. The British Medical Association has produced its scheme, which still holds the field. The criticism has been made that in actual working the scheme would be very costly, but it may well be that a thorough examination of present arrangements would show that a properly organised and efficient system could be thought out, built up, and got to work at a cost not exceeding what the country might reasonably be asked to incur.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 31ST, 1937

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1593; diphtheria, 890; enteric fever, 33; pneumonia (primary or influenzal), 381; puerperal fever, 31; puerperal pyrexia, 102; cerebro-spinal fever, 11; acute poliomyelitis, 17; acute polio-encephalitis, 3; encephalitis lethargica, 1; dysentery, 25; ophthalmia neonatorum, 101. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 6th was 2836, which included: Scarlet fever, 713; diphtheria, 699; measles, 189; whooping-cough, 479; puerperal fever, 15 mothers (plus 9 babies); encephalitis lethargica, 282; poliomyelitis, 5. At St. Margaret's Hospital there were 26 babies (plus 16 mothers) with ophthalmia neonatorum.

Deaths.—In 124 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 7 (0) from measles, 2 (0) from scarlet fever, 9 (2) from whooping-cough, 22 (1) from diphtheria, 40 (13) from diarrhœa and enteritis under two years, and 8 (1) from influenza. The figures in parentheses are those for London itself.

The only death from enteric fever occurred at Gillingham. Nottingham had two fatal cases of measles. Diphtheria was fatal in 17 great towns; in 4 cases at Liverpool, 3 at Manchester. Liverpool and Newcastle-upon-Tyne each reported 4 deaths from diarrhœa: Huddersfield and Birmingham each 2.

The number of stillbirths notified during the week was 288 (corresponding to a rate of 39 per 1000 total births), including 53 in London.

SPECIAL ARTICLES

THE CONTACT IN INDUSTRY

AN ANALYSIS OF TEN YEARS' EXPERIENCE

By W. L. Scott, M.C., M.D. Glasg.
SECOND MEDICAL OFFICER TO THE POST OFFICE

When absence from work on the part of a contact with infectious disease is enforced to prevent the spread of that disease and to safeguard the rest of the staff, the financial considerations involved, particularly in an industrial undertaking such as the Post Office which provides a vital service, may be material. The control of the contact problem is therefore one which requires thought in the organising of a system which will satisfy all these interests, and the difficulties are further increased by the belief, still deeply rooted in the lay mind, and to some extent in the minds of a considerable number of medical men, that a contact with infectious disease remains a danger to others until the quarantine period is over.

Post Office experience, covering a period of over ninety years, and a system of control which has been modified from time to time as circumstances and changing views dictated, are gradually leading to the abolition of quarantine. Since the year 1898 which saw the establishment of the present system, there has been no epidemic of any scheduled infectious disease in the Post Office and no recorded case of a contact infecting another member of the staff. In that year the first official form was produced for general use for all contacts with infectious disease, and in 1924 an important addition was made when it was requested that every contact who developed the disease within one month of the termination of the invalid's illness should report the fact. This has enabled us to obtain information regarding the infectivity of all the infectious diseases enumerated in the Post Office rules and the records of the past ten years have, therefore, been chosen as a basis for the present review.

Before summarising the results, a brief account of the system now in force may be of interest. It is obligatory for every Post Office employee in England, Scotland, Northern Ireland, and Wales in whose family infectious or suspected infectious disease has occurred, to report the fact to his or her supervising officer who in turn refers this report to the chief medical officer for his advice. If the disease is small-pox, plague, typhus fever, or cholera, the contact must remain at home until all the necessary disinfection of the premises has been carried out and the chief medical officer is satisfied that resumption of duty may take place with safety, if necessary under medical supervision.

Scarlet fever contacts remain at home until either the patient has been removed to hospital and disinfection carried out, or the patient has been satisfactorily isolated at home, or the contact has removed to other lodgings. In the very rare instances where it has not been found possible to remove the patient to hospital and efficient isolation is not practicable, the contact is not allowed to resume duty until the illness is ended. As a rule the chief medical officer directs that all those Post Office employees who have had personal contact with the invalid or anyone attending him, all contacts where the patient is nursed at home, and all young persons should be sent to the medical officer and remain under his observation for as long as the latter considers necessary—unless the contact has previously suffered from the disease. Meanwhile, provided that the rules have been complied with, the contact remains at work.

Where contact has followed a case of diphtheria, the officer concerned is not allowed to resume duty without a medical certificate of good personal health. He reports for duty in the ordinary way, but before being allowed to commence work he is sent to the medical officer for examination. If a throat-swab is considered necessary, absence is allowed pending the result.

Enforced absence is not required in cases of contact with such diseases as measles, German measles, chicken-pox, mumps, erysipelas, whooping-cough,

CONTACTS WITH INFECTIOUS DISEASES

Year.	Small-pox.		Scarlet Fever.		Diph-theria.		Measles.		German measles.		Chicken-pox.		Mumps.		Erysipelas.*	Whooping-cough.*	Enteric fever.*	Encephalitis lethargica.*	Cerebro-spinal meningitis.*	*
	Con-tacts.	Dev. dis.	Con-tacts.	Dev. dis.	Con-tacts.	Dev. dis.	Con-tacts.	Dev. dis.	Con-tacts.	Dev. dis.	Con-tacts.	Dev. dis.	Con-tacts.	Dev. dis.	Con-tacts.	Con-tacts.	Con-tacts.	Con-tacts.	Con-tacts.	Dev. dis.
1927 ..	52	2	1692	4	833	1	1483	3	122	—	814	2	416	2	53	28	2	4	—	—
1928 ..	60	2	1822	10	938	2	2737	5	109	2	852	6	319	5	52	20	34	—	2	—
1929 ..	92	2	1915	11	984	3	1128	1	630	1	692	3	364	2	50	12	34	2	1	—
1930 ..	196	2	1873	6	1117	8	2695	3	201	—	749	4	515	8	46	9	37	2	—	—
1931 ..	62	3	1468	12	665	3	1139	—	132	1	787	4	257	5	52	13	38	2	5	—
1932 ..	34	—	1450	3	538	1	2087	3	177	1	686	3	245	1	47	14	25	1	3	—
1933 ..	12	—	2187	10	558	5	903	—	167	1	598	3	273	6	48	14	12	—	7	—
1934 ..	8	—	2378	4	797	4	2263	7	318	2	639	1	315	3	69	9	9	—	2	—
1935 ..	Nil	Nil	1602	4	724	1	766	1	191	—	564	2	364	1	48	13	32	—	—	—
1936 ..	Nil	Nil	1457	7	543	—	2235	3	218	1	619	4	395	1	62	17	29	—	1	—
Totals .	516	11	17,844	71	7697	28	17,436	26	2265	9	7000	32	3463	34	527	149	252	11	21	—

Dev. dis. = developed the disease.

encephalitis lethargica, enteric fever, and epidemic cerebro-spinal meningitis, unless the medical officer of health, for some exceptional local reason, advises quarantine. Each contact, however, is warned that he or she must not nurse or otherwise attend upon the invalid, but if it is essential that any of these functions should be performed by the contact, leave is allowed without pay. Boys and girls are usually kept under the special observation of their supervising officers and the medical officer consulted if they show any signs of ill health during the quarantine periods. The Post Office employs some 260,000 men and women between the ages of fourteen and sixty, and during the past ten years 57,312 of these reported infectious disease in their homes. The accompanying Table gives details regarding this number.

It will be noted that during the period under review there were no cases of plague, typhus fever, or cholera. In 1935 and 1936 there were no cases of small-pox, and the remaining eight years showed a total of 516 cases. One contact in 46 developed the disease within a month of the termination of the invalid's illness—a percentage of 2·1.

Scarlet fever contacts amounted to 17,844, and only 1 in every 251 cases (0·39 per cent.) subsequently developed the disease. Measles contacts numbered 17,436, and only 1 contact in every 670 (0·14 per cent.) subsequently developed the disease. Diphtheria contacts amounted to 7697, and of these only 1 contact in every 274 cases (0·36 per cent.) subsequently developed the disease. Chicken-pox contacts numbered 7000, and only 1 in every 218 (0·45 per cent.) subsequently developed the disease. Mumps contacts numbered 3463, and only 1 contact in every 101 (1 per cent.) subsequently developed the disease. No contacts in any of the other groups developed the relative disease.

It will be clear from these results that either the system is a sound one or else we are exaggerating the dangers of these diseases as regards their infectivity; but it should perhaps be remembered that these statistics apply only to a group of persons whose ages lie between fourteen and sixty, and it may be that a smaller risk of infection at these ages has an important bearing on the results. Prolonged observation, however, supports the view that infection, for all practical purposes, cannot be carried by a third person—that is, provided that the contact takes precautions to avoid coming into contact with the invalid, remains in good health, and is removed from duty on showing signs of illness during the quarantine periods. It seems highly probable that when the person who has been in contact with an infectious disease can be adequately controlled, the time will have come when quarantine may be safely abolished.

I should like to record my thanks to all those who have assisted in the preparation of these figures, and particularly to Mr. R. F. Tickle of the Medical Branch.

A NEW HOSPITAL FOR CUMBERLAND.—Whitehaven Castle, now used as a hospital and once a residence of Lord Lonsdale, is to be vacated and a modern hospital is to be built on a country estate two miles from Whitehaven at a cost of £149,000. It is expected that the Commissioner for Special Areas and the Ministry of Health will give a grant of about 80 per cent., and the County Council has promised a grant of £15,000 and an annual contribution of £500. The new building will provide for twice the number of patients now treated at Whitehaven Castle, and will have a special maternity wing and X ray and electrical departments.

MEDICINE AND THE LAW

Puerperal Fever: Verdict against Hospital and Doctor

A MATERNITY patient in Ashby-de-la-Zouch Cottage Hospital who contracted puerperal fever with most serious results has been awarded £3500 damages, in addition to out-of-pocket expenditure, on the ground of the negligence of the hospital and the doctor concerned. The judgment is subject to appeal. Meanwhile the disquieting conclusions which Mr. Justice Singleton has drawn from evidence which he must be taken to have accepted deserve full study.

Mrs. Heafield, the plaintiff, began her action against the hospital. She named as defendant Mr. Crane, chairman of the management committee, suing him as a representative of the hospital which is presumably not an incorporated body and therefore not technically a legal entity capable of forensic recognition. At a later stage she added as a second defendant Dr. J. W. Hart of Measham, her medical attendant. It remains to be settled in what proportion the respective defendants will pay the damages awarded and in what manner the hospital will raise its share. A year ago [1] the judgment of the House of Lords in Lindsey County Council *v.* Marshall illustrated the legal responsibilities as well as the medical dangers in respect of the admission of a maternity patient to a hospital infected by puerperal fever. The Ashby-de-la-Zouch case is a fresh warning. It can scarcely avoid attracting public attention. Women, said Mr. Justice Singleton, are encouraged to go into hospital for their confinements because of the greater facilities for cleanliness and safety; he had no hesitation in declaring that Mrs. Heafield would have been far safer at home. Some of the lessons of the case are set out on another page. In this column a summary is offered of the outlines of the litigation. After a patient hearing, judgment was reserved; it was delivered in London on the eve of the Long Vacation.

THE STORY OF THE CASE

The Ashby-de-la-Zouch and District Hospital has a maternity block consisting of a 5-bed ward, another 2-bed ward, three single-bed wards, a labour ward, and a further room described as the old labour ward. The maternity patients are attended by their own doctors. The hospital is run by a management committee and has five honorary medical officers, one of whom was Dr. Hart, whom Mrs. Heafield made a defendant in her action. Mrs. Heafield, by previous arrangement, entered the hospital for her confinement. She came in at about 7.30 A.M. on Jan. 5th, 1936. Dr. Hart was summoned and the child was born shortly before 11.30 A.M. in the old labour ward, the usual labour ward being occupied. At 6 P.M. Mrs. Heafield was moved into the 5-bed ward. Her temperature was then 100·4°; next morning it was below normal and Dr. Hart found her to be quite well. The first hint of anything amiss was a rise of temperature on the evening of Jan. 6th to 101·4°; next morning it was 102·8°, and, according to the hospital report, the patient was complaining of headache. That night the thermometer showed 104·6°; after a hypodermic injection of S.U.P. by Dr. Hart there was a slight fall. Mrs. Heafield says she felt sometimes very hot and sometimes very cold with violent shivering fits. These symptoms were

[1] See *Lancet*, 1936, **2**, 211.

known to her husband (who was seeing her almost daily) and also to the nurse; it was stated that they were mentioned also to Dr. Hart, though the point was disputed. On the 8th Mr. Heafield told Dr. Hart that the patient was feeling very hot; Dr. Hart is said to have replied that everything was quite normal. On the 9th the temperature rose again and on the 10th Dr. Hart gave another injection of S.U.P. Meanwhile on the 8th he had taken a significant step to which the judge obviously attached great importance at the trial. Besides Mrs. Heafield Dr. Hart had another patient already in the maternity block, a Mrs. Ingham, of whose illness more will presently be said. On the 8th Dr. Hart notified both cases as puerperal fever, giving the date of onset in Mrs. Heafield's case as Jan. 6th and in Mrs. Ingham's as Jan. 4th. He was obviously worried at this stage, for he wrote a strong letter on the same day (Jan. 8th) to the secretary of the hospital committee, drawing attention to "a most undesirable state of affairs in the Cottage Hospital." Two of his maternity patients, he wrote, both perfectly healthy women who had perfectly normal confinements, had developed puerperal infections and were seriously ill. "In view of the great publicity which has recently been given by the press to diseases of childbirth and maternal mortality, I feel that the strictest precautions ought to be taken to prevent further trouble; I regret to say that in my experience the majority of maternity cases develop some septic infection whilst in Cottage Hospital, which is suggestive of faulty nursing." Dr. Hart afterwards said that this letter had been too vigorously worded. As a contemporary document it was, of course, important evidence of his anxiety and of his diagnosis at the time. On the 18th the husband and mother of Mrs. Heafield found her flushed, delirious, and hardly able to recognise them. The judge accepted the husband's account of an interview in which Dr. Hart agreed to obtain a second opinion. Mr. C. D. Lochrane, a gynæcologist and consultant at Derby, was therefore called in. After examining the patient, he broke to the husband, in Dr. Hart's presence, the critical nature of Mrs. Heafield's illness; he said she was suffering from puerperal fever, must be moved at once, and had better go to the Derby Hospital for Women; she was almost certain to require blood transfusions. She was removed to Derby by ambulance on the 19th and there followed a long and serious illness with surgical operations of which more will be said later. For the moment the important point is that this interview with Mr. Lochrane on the 18th was the first time, according to Mr. Heafield, when he heard puerperal fever mentioned with regard to his wife. Dr. Hart, of course, had already notified the case as such ten days earlier; in his evidence at the trial he said he had no doubt that Mrs. Heafield was suffering from puerperal fever or that her present ill health is due to that disease.

Nobody can extract damages from a doctor or a hospital merely because a patient contracts puerperal pyrexia. A plaintiff has to prove in the first place some want of care or some breach either of contract or of duty, and in the second place the fact that injury is due thereto. Mr. Justice Singleton had therefore to address himself to the question when and from whom Mrs. Heafield contracted her illness. He was satisfied that she was in good health when admitted. Some evidence was offered by witnesses called by the defendants which might suggest that she came in with a cold. The judge disbelieved this suggestion of an alternative explanation of the high temperature; Dr. Hart had noticed no signs of a cold; had there been any, he must have observed them. As if to support the suggestion, a sister had written into the report-book under the date of Jan. 5th (the date of admission) the words "seems to have a cold." Not being written in the same ink as the rest of the entry, these words led to questions at the trial; it turned out that they had been inserted on the instructions of the matron long after the day to which they purported to belong. The judge described the incident as "most unfortunate." He accepted instead an explanation of the infection which was at any rate more straightforward. Mrs. Heafield, being perfectly well on admission and having had a normal pregnancy, was placed in a ward along with four other maternity patients. One of these, Mrs. Ingham, also (as already stated) attended by Dr. Hart, had been admitted on Jan. 1st and had been confined that day. Her temperature had risen to 100·4° within a few hours of the birth. The judge accepted this as unimportant; but on Jan. 3rd and again on Jan. 4th Mrs. Ingham had a shivering fit. Her two sisters who were present on the latter occasion corroborated the story here though the information was apparently not given to Dr. Hart.

On the evening of Jan. 4th Mrs. Ingham's temperature was 103·2°. The night report (at 6 A.M. next day) showed "temperature 104° and lochia offensive." The day report for Jan. 5th showed 103·2°; the night report next morning said "slept well, not complaining, lochia still offensive, temperature 101°." The day report on the 6th was "temperature 101·6°, seems better to-night"; the night report on the 7th was "lochia offensive, temperature 103°"; the day report of the 7th showed the temperature 104·2°. On the evening of the 7th Dr. Hart administered a hypodermic injection of antistreptococcal serum and the temperature fell considerably.

Mrs. Ingham left the hospital on Jan. 19th; she was not really well for some time. Dr. Hart afterwards told her that she had suffered from puerperal fever; he had, as already stated, notified the case as such on Jan. 8th. "I think," said Mr. Justice Singleton, "he was right in his diagnosis."

If the defendants could have shown that Mrs. Heafield was already infected when she entered the hospital, or that her illness was different from that of Mrs. Ingham, the plaintiff's claim would have had a different result. There was some evidence in this direction. Mr. A. B. Danby and Mr. W. E. Barnie-Adshead, called on behalf of the hospital, expressed the view that Mrs. Ingham did not suffer from puerperal fever; but, as the judge pointed out, they were in a difficulty because they had no record by the doctor attending her nor did they see the patient. They saw only the temperature charts and possibly extracts from the hospital reports wherein there was no mention of the shivering fits. Nor did these witnesses hear the evidence of Dr. Hart whose case was not begun when they were in the box. Mr. Barnie-Adshead described the signs of streptococcal infection—local infection, offensive lochia, and tenderness of the uterus, plus a pulse rise, plus rigor, and general malaise. These, he said, were the signs for which a general practitioner would look, together with high temperature. He himself was apparently not satisfied that anything more than high temperatures were present; he was not satisfied of the offensive lochia or the rigor; the judge however was satisfied of both. Another witness, Mr. J. P. Hedley, giving evidence on behalf of Dr. Hart, expressed the view that Mrs. Ingham's case was a localised infection of the uterus, falling into the sapræmia group. He said he would have come to the same conclusion with regard to Mrs. Heafield

on the chart alone, but the bacteriological result led him to a different conclusion. Between Feb. 7th and 11th four specimens of pus were taken from different parts of her body and a culture was obtained of each; the germ found was a pneumococcus. Mr. Hedley, by whose evidence the judge expressed himself as considerably impressed, thought Mrs. Heafield was a pneumococcal case, the infection arising more probably outside the hospital. On the other hand Dr. John L. Berry, of Burton-on-Trent, held Mrs. Heafield's to be a streptococcal infection and said his view was not affected by the finding of a negative result from a blood culture or by the finding of pneumococci in the pus at a later date. The judge, while allowing full weight to Mr. Hedley's view, did not think that the mere presence of pneumococci in the pus pointed with certainty to the original infection having been pneumococcal; nothing in the evidence induced him to believe that Dr. Hart was wrong in diagnosing the cases of Mrs. Heafield and Mrs. Ingham as being of the same character; both were cases of puerperal fever beginning with local infection; Mrs. Ingham recovered fairly soon, but the infection spread in Mrs. Heafield's case and septicæmia was unfortunately followed by the trouble which remained with her. The judge recalled that on Jan. 21st Dr. Hart had told Mr. Heafield that Mrs. Heafield got her illness from Mrs. Ingham, and that it was in fact puerperal fever. Accepting this as correct, the judge said it did not greatly matter how and from whom Mrs. Ingham was infected. Mrs. Ingham was suffering from puerperal fever on Jan. 4th and onwards. Mrs. Heafield, within about seven hours of giving birth to her child, was placed in the same ward. Mrs. Ingham had a temperature of 104° and Mrs. Heafield's bed was opposite the end of Mrs. Ingham's. There were other suspicious cases in the hospital at the time. The judge commented on the fact that fresh maternity cases were being admitted while existing patients had high temperatures; the doctors did not know that other doctors' patients were running high temperatures and showing dangerous symptoms; it did not occur to the matron to tell them. Mrs. Ingham's case, he said, was suspicious on Jan. 4th and was clearly one of puerperal fever or infection on the 5th; that night there was obviously sufficient to show that no healthy patient should go into the ward where Mrs. Ingham was; yet Mrs. Heafield was placed in the ward, no precautions were taken, and the same sister or nurse went from one patient to the other and attended to the dressing of all. The judge quoted the following passage from Sir Bernard Spilsbury's evidence:—

"When notifiable fever occurs, the case should be isolated from other patients and no other patient should be admitted to the same ward or room until it has been thoroughly cleaned and sterilised; the nurses attending a septic case should never be allowed to attend another clean case; the nurses ought always to have their clothing covered with sterilised gowns; they should wear masks and, most important of all, wear gloves; in every case steps should be taken to trace the source of the infection."

Mr. Justice Singleton did not regard this as too high a standard for the maternity block of a hospital. It was part of the plaintiff's case that the sister who was assisting Dr. Hart at the delivering of Mrs. Heafield wore neither antiseptic overall nor mask nor gloves; she said she was not in the habit of doing so unless specially directed by the doctor. The judge in this connexion quoted from Mr. Hedley's evidence:

"I always use a mask myself when attending a confinement; the attendant at a labour should wear a mask, I think; gloves should be worn too; if there is a suspected case of infection in the ward, all the more need for gloves."

Apart from any lapse from proper standards of hospital practice there was a question of compliance with the statutory regulations. The judge gave Dr. Hart credit for having notified the cases of Mrs. Heafield and Mrs. Ingham. Of the other patients "in more than one case there ought to have been notification of puerperal pyrexia, but in no case was it done before the matters I have spoken of came to light. There was complete disregard of the statutory regulations by which a medical practitioner is required to notify all cases of puerperal pyrexia on his becoming aware of them." These Public Health (Notification of Puerperal Fever and Puerperal Pyrexia) Regulations, 1926 (Statutory Rules and Orders 1926, No. 972) were accompanied by a circular letter from the Ministry of Health to local authorities dated August 9th, 1926. The letter stated that the Minister

"desires to take this opportunity of impressing upon all those concerned with the administration or treatment in maternity institutions that the presence of infection, however slight in degree, in a patient or any member of the staff should be considered as liable to give rise to an outbreak of virulent infection and should be dealt with accordingly."

The judge thought it "regrettable to say the least" that the regulations were ignored. It was in Dr. Hart's favour that he reported his two cases on Jan. 8th, but he was not familiar with the regulations or with the forms in the schedules thereto on which the doctor can ask for a second opinion, for a bacteriological examination of lochia or blood, or for other hospital treatment. He used a general form notifying the date of onset of the pyrexia. Mr. Justice Singleton thought that conditions at the hospital were "most lamentable" and hoped that they would never recur. He was, it would seem, particularly surprised to find that none of the doctors who had patients in the hospital had any idea or suspicion of infection in the case of the other doctors' patients until the date of Mr. Lochrane's visit—about a fortnight after the day assigned by Dr. Hart as the date of onset of puerperal pyrexia in Mrs. Ingham's case.

Summary of the Legal Position

Summing up the legal position resulting from these findings of fact, the judge considered first

THE LIABILITY OF THE HOSPITAL

On behalf of Mr. Crane, the chairman of the hospital committee, it had been submitted that, from the moment when Dr. Hart arrived to deliver Mrs. Heafield, the matron, sisters and nurses were *his* servants and so remained all the time while Mrs. Heafield was at the hospital. Dr. Hart, it was said, agreed that his other patient, Mrs. Ingham, was a danger and he did not dispute that the admission of Mrs. Heafield into the ward where Mrs. Ingham was being nursed was unjustifiable. But it was argued that Mrs. Ingham and Mrs. Heafield were Dr. Hart's patients and that the only duty of the hospital was to communicate with the husband or doctor; as the doctor knew the facts, there was no breach of duty in not removing her. The hospital further contended that, if the matron was at fault, she was independently exercising her professional skill and was not the servant of the management committee. Counsel referred to the dictum of Lord Sankey in Lindsey C.C. *v.* Marshall—"in the case of a nursing-home conducted by local authorities, the

local authority is not responsible for negligence of doctors, matron, or nurses while acting in the exercise of their professional functions and knowledge." Counsel added that the matters wherein the defendants were alleged to be at fault in Mrs. Heafield's case were matters involving exercise of professional functions and knowledge; if there was any act resulting from the exercise of purely administrative duty by the management of the hospital, there was no evidence upon which a jury could find a breach of duty or negligence. This contention used to be better known as the principle of Hillyer *v.* St. Bartholomew's Hospital. A hospital committee has not the technical knowledge necessary for diagnosing a patient's illness, prescribing an appropriate medicine, or deciding upon the nature and moment of surgical operation. It is bound to leave these matters to experts whom in these problems of professional skill it has neither the wish nor the ability to control. Consequently the sole responsibility of the hospital committee is the choice of competent experts. But the House of Lords in the Lindsey County Council case narrowed this immunity. Lord Hailsham said that the complaint was that the local authority invited Mrs. Marshall to a home which it ought to have known was in a dangerous condition, and failed to inform her of the facts which constituted the danger. In Lord Wright's parallel the duty was scarcely distinguishable from what would be the local authority's duty if there was good reason to suspect that the drains of the maternity home were defective and involved a risk of typhoid to the patients. The local authority of course would have to be guided by sanitary engineers and hygienic experts; but it would be responsible for their negligence—similarly if a defective ceiling was left negligently unrepaired so that it collapsed and injured a patient in her bed. The duty was in essence not dissimilar from that of a householder who has to take care that persons invited into the house are not negligently exposed to danger or at least are duly warned of the risk—for instance, if there has been scarlet fever in the house so as to involve infection. In the Ashby-de-la-Zouch case, said Mr. Justice Singleton, the matron could not absolve herself or the hospital authorities from responsibility by saying "I relied on the doctor" or "the doctor did not tell me." She is the head of the hospital and is in charge on the administrative side. She makes the arrangements to receive the patients (under the hospital rules) and she, or one of her staff under her direction, decides into which bed or ward a patient shall go. She must be taken to know the conditions of the hospital and of the maternity ward in particular. It is her duty not to subject patients to risk of infection. If she receives a patient into a ward where there is infection, she invites the patient into a dangerous place. The matron was acting on behalf of the hospital authorities and was in no sense the servant or agent of Dr. Hart. Indeed, said the judge, it was not proved that Dr. Hart knew the condition of Mrs. Ingham before Mrs. Heafield's admission. Those at the hospital failed in the duty they owed to Mrs. Heafield not to place her in a ward where there was a suspicious case. From that failure of duty damage resulted, and the hospital authorities were liable in damages.

THE LIABILITY OF DR. HART

The judge now turned to the liability of Dr. Hart. The latter's counsel, apart from the dispute on the facts, submitted that Dr. Hart was not responsible for the admission of Mrs. Heafield to the hospital or to the ward, and, secondly, was not responsible for the failure to remove her from the ward. It was true, said the judge, that Dr. Hart did not so admit her, but he had in the hospital ward a patient (Mrs. Ingham) who was a gravely suspicious case on Jan. 4th; he knew her condition on the 5th. Dr. Hart ought to have taken steps to isolate Mrs. Ingham and to prevent infection spreading. That was a duty he owed to the other doctors who had patients there and to the hospital of which he was an honorary medical officer. It was a duty he owed to Mrs. Heafield, who was his patient and had just given birth to a child. Mrs. Heafield was in consequence infected and contracted puerperal fever from Mrs. Ingham—"through a nurse or, directly or indirectly, from Mrs. Ingham." He never caused Mrs. Heafield to be removed, made no protest to the matron, gave no instructions and uttered no warning of the danger of infection. He left his patient exposed to it. A second point was that, until Jan. 18th or 19th after Mr. Lochrane had been called in, Mr. Heafield was never told of the nature of his wife's illness. "In a case such as this, I believe it to be the duty of the medical attendant to advise the husband of the patient's condition, so that he may have a second opinion if he wishes." If Dr. Hart had told the husband, or had himself suggested a second opinion earlier, some steps might have been taken in better time to ascertain the cause of the trouble; this might have improved the chances of the patient. Mr. Barnie-Adshead, a witness for the hospital, said that a swab ought to have been taken on Jan. 7th; it might have saved much suffering. It may be recalled that the failure to inform the husband was an element in the negligence in the Lindsey County Council case last year.

The remaining issue was

THE QUESTION OF DAMAGES

Mrs. Heafield had been four months in the Derbyshire Hospital for Women under Mr. Lochrane. On many occasions pus was drawn from her body, on one occasion three pints. Then she went home. She was reduced to less than 5 st. in weight and she was crippled. A bony change on both hips made movement at these joints impossible; her legs had to be up as she lay in bed; she was bent with the legs at an angle to the trunk. She was twice operated upon at the Hospital for Cripples in Birmingham. Each operation involved cutting through a thigh-bone in order to give a fresh alignment; some further operation may be necessary. There was stiffening in one shoulder and in one wrist. She will not be able to walk normally. "She will be able," said the judge, "to waddle about the house and do something on the ground floor." Nothing in the way of damages, he continued, could compensate for the pain and suffering in such a case as this. Having awarded the sum of £3500 for general damages as already stated and £149 2*s.* for special damage, the judge directed a stay of execution till Oct. 1st; if the damages are brought into court by that date and notice of appeal is given, there will be a further stay till the appeal is heard. The special damage is to be paid in any event. The court directed that execution should not be issued against Mr. Crane, the chairman of the hospital committee, without further application; after all, Mr. Crane is doing a public service in that capacity, said the judge, and should not be lightly subjected to a burden of that kind. But the court declined at present to make any suggestion as to the apportionment of liability between the two defendants. Thus ended a trial which had occupied

five days at Derbyshire assizes. Dr. Hart's defence was conducted by Messrs. Le Brasseur and Oakley for the London and Counties Medical Protection Society and he can certainly feel that his advisers presented his case with all the resources at their command. The fact was mentioned that Mrs. Ingham has again been confined since the dates material in Mrs. Heafield's action and has again been attended by Dr. Hart.

INTERNATIONAL POPULATION CONGRESS

THE congress organised under the auspices of the International Union for the Scientific Study of Population Problems was held in Paris on July 29th–31st and August 1st, and was attended by delegates from 30 countries including 22 from Great Britain. The congress was opened in the presence of M. Albert Lebrun, president of the Republic, and then divided into five sections. The variety of the subjects dealt with shows how complex are the population problems that now press for solution, and with what interest they are being studied in many parts of the world.

MEASURING CHANGES IN POPULATION

A full session of the congress was devoted to discussing methods of measuring the tendencies of population growth, a subject on which distinguished work has lately been done by Burgdörfer, Kuczynski, and Lotka. It is known that birth-rates, death-rates, and rates of natural increase computed on the total population give not merely an inadequate but a misleading indication of the real balance between fertility and mortality, and that little, if anything, is gained by the use of rates based on an arbitrarily chosen "standard" population. A community may have an annual excess of births over deaths and yet be reproducing at a rate insufficient to bring the number of births in the next generation up to the number of births in the present generation. That this is now the position in most countries of Western Europe and in the United States has been shown by the use of the net reproduction-rate, an index explained in a series of important books by Dr. Kuczynski; and it seemed to be generally thought that this rate is the most widely useful index for measuring the real balance of fertility and mortality and for showing where present tendencies are taking us.

GERMAN MEASURES TO INCREASE POPULATION

Among the papers that attracted most attention were two dealing with the measures taken by the National Socialists to increase population growth in Germany. One by Dr. F. Ruttke, director of the Reich committee for national health service, gave an account of the more important measures (apart from the provision of marriage loans of which much has already been heard) adopted to encourage the production of large families: allowances to parents of not less than four children under 16 years, rebates of taxation rising steeply with each successive child, substantial reductions in railway fares, housing facilities, rent allowances, and preference to fathers of large families in filling vacant situations. Various public corporations now arrange for "family burdens adjustment," among them the Association of German Insurance Doctors. Since July 1st, 1934, the insurance societies have transferred 2 per cent. of their contribution income to the head office of the association to form a family burdens adjustment fund, from which a monthly sum of 50 marks is paid to an insurance doctor for each child after the second, so long as his income from insurance practice does not fall below 1000 marks per annum. The payments are made by the association direct to the doctor. A somewhat similar scheme has been adopted by the German Apothecaries Society. Dr. Ruttke held, however, that the offer of economic advantages formed a comparatively small part of the German population policy, since it was realised "that hitherto no State had succeeded by economic measures alone in stopping the decline of a people in numbers and quality." He attached more importance to what he called the moral and intellectual recuperation of the entire people, which he thought the National Socialists had brought about in Germany.

Dr. F. Burgdörfer, director of the German statistical office, gave the following figures showing the success so far achieved by the German population policy, which was adopted in 1933.

Year.	Number of births.	Number of births per 1000 population.
1933	971,000	14·7
1934	1,198,000	18·0
1935	1,264,000	18·9
1936	1,279,000	19·0

Dr. Burgdörfer agreed with Dr. Ruttke in attributing the success of the German population policy chiefly to the new outlook on life, especially family life, now taken by the German people.

URBAN AND RURAL ECONOMIC PROBLEMS IN AMERICA

One of the most striking features of the congress was the valuable group of papers contributed by the American delegates, most of whom had already won an international reputation by their writings on population. In its enormous area, and in the extraordinary variety of its social, economic, and racial conditions, the United States presents a field of unique demographic interest; and the data afforded by the official census and vital statistics have been considerably supplemented by the results of special inquiries undertaken by voluntary organisations, notably by the Milbank Memorial Fund and the Scripps Foundation. American students of population have not been backward in utilising their opportunities, and in no other country has more attention been given to the numerous problems, quantitative and qualitative, of population. In the United States, as in other countries, increasing urbanisation is characteristic of modern life. Whereas in 1870 the people living in cities of 25,000 population or more, and the people living in places with less than 2500 population formed 15·1 per cent. and 73·8 per cent. respectively of the total population, the corresponding percentages in 1930 were 40·1 and 43·8. In the cities fertility is low. Dr. Truesdell, of the U.S. Census Bureau, stated in his paper that "at the present time the rate of natural increase in most cities is either below zero or so close to it as to be negligible." Among the farm population, on the other hand, fertility is so high that many of the young people are unable to find employment on the farms—a condition that becomes intensified with improved farming technique—and stream into the cities. But rural fertility is now declining; and unless there is a considerable increase in immigration population growth in the United States will probably stop well within the present century. The usual forecast is that the maximum population will be reached

between 1970 and 1980, but Dr. O. E. Baker, of the U.S. Department of Agriculture, who has made a special study of the farm population, is inclined to think that some time about 1950 is a more likely date.

Prof. Raymond Pearl, who unfortunately was unable to attend in person, contributed a remarkable paper on the association of relatively low fertility with relatively high economic position. His study, which was based on the reproductive histories of 22,657 American women, of whom 19,613 were white and 3044 negroes, showed that increasing economic status was closely associated with (1) increasing age at marriage, (2) increasing use of contraceptive methods, and (3) increasing efficiency in the use of such methods. He found also that induced abortions were much more frequent among the women who practised contraception than among those who did not, and he concluded that if it were not for these factors there would be little, if any, difference in fertility between the different economic classes.

RECENT MOVEMENTS IN IRELAND

Among the papers contributed by the British delegates was one by Prof. A. M. Carr-Saunders and Mr. R. S. Walshaw on a subject to which little attention has hitherto been paid—recent population movements in Ireland. The authors pointed out that the decline of population between 1846 and 1931 in the territory now known as the Irish Free State was due not to birth control but to late and few marriages and to a large emigration, chiefly to the United States. Since 1932 the population has begun to increase, because marriages have become more frequent and take place at earlier ages. Though emigration has diminished it is still considerable, but is now directed to Northern Ireland and Great Britain, which every year receive accessions of population from the Free State. Sir Charles Close read a paper on the calculation of death-rates, in which he drew attention to the unsatisfactory nature of the rate derived by comparison with the "standardised" population, and suggested that instead of such rates there should be general acceptance of the life-table death-rate—i.e., the reciprocal of the expectation of life at birth, in years, multiplied by 1000. Mr. D. V. Glass read a paper on economic fluctuations in marriage frequency, and Dr. Conyers Morrell one on recent changes in the seasonal distribution of marriages and their influence on the incidence of births and of infant mortality.

INCREASE IN JAPAN

An important paper was submitted by Mr. Inouye, director of the Institute for the Study of Population Problems in Japan, who said that about 1900 the population of Japan entered upon a period of rapid increase, and that although since 1920 the birth-rate has declined the death-rate has also declined, so that the rate of natural increase is still high. He estimated that the population of Japan (excluding Korea, Formosa, and Saghalien), which in 1935 was 69,254,000, will be about 95,000,000 thirty-five years hence. This rapid population increase created problems the ultimate settlement of which lay, he thought, in the real understanding and sympathy of the nations of the world and in international coöperation.

ALIEN IMMIGRANTS IN FRANCE

Papers of exceptional interest were contributed by the French delegates. M. Mauco gave an account of an inquiry now being made into questions arising from the large number of alien immigrants working in French agriculture, not only as wage-earners but as small proprietors. Certain French departments, such as Lot-et-Garonne and Gers, depopulated by the decline of the French birth-rate, have in recent years been largely colonised by Italians, and there has been also a considerable immigration of Belgians, Spaniards, and Poles. The aliens for the most part have a lower standard of living and a much higher natality than the French, and form a steadily increasing proportion of the population of France.

Particulars were given of a circular issued in July, 1937, by the Minister of Education prescribing that in French schools instruction should be given on population questions, in particular on methods of measuring population growth and on the importance of considering the age composition of the population.

The organisation of the congress was a model of efficient and tactful working, thanks chiefly to its president, M. Adolphe Landry, ably seconded by M. Boverat, who performed remarkable feats of translation in three languages. In the discussions and in the social gatherings an encouraging spirit of cordiality prevailed.

THE LANCET 100 YEARS AGO

August 12th, 1837, p. 731.

The following are copies of the questions put at the examination for prizes at University College. The candidates were secluded for ten hours, while preparing their answers, without books, or the possibility of communicating with each other :—

UNIVERSITY COLLEGE, LONDON. EXAMINATION APRIL, 1836–37.

Principles and Practice of Medicine.—First Paper.

1. What are the phenomena of the blood and its vessels in active hyperemy; and what are the phenomena of suppuration and mortification?
2. What are the chief means to be employed in the treatment of continued fever, and the rules for their respective administration?
3. What are the symptoms and sequelæ of scarlatina; and the treatment of the disease and its sequelæ?
4. What diseases of the skin are generally inflammatory, and what are often atonic, or cachectic; and what are the distinguishing characteristics of the two conditions?
5. What is the distinction in the symptoms, between inflammatory and non-inflammatory affections of the head; and what are the remedies for the latter?
6. What are the characteristics of insanity; and what are the principal points in its treatment?

Second Paper.

1. What is the distinction between spasmodic and inflammatory cough, and spasmodic and inflammatory dyspnœa; and what are the remedies of the spasmodic, with the rules for their administration?
2. What morbid sounds occur in the heart and arteries; and under what circumstances do they occur?
3. What are the various forms and causes of gastric and intestinal hæmorrhage; and what are the respective remedies, with their doses?
4. What are the nature, situation, effects, and treatment, of biliary calculi?
5. What are the phenomena of a phosphatic disposition of the urinary organs; and what is its treatment?
6. What are the various causes of deficient micturition; and their distinguishing characteristics?

JOHN ELLIOTSON, Professor.

*** John Elliotson, who was largely instrumental in the founding of University College Hospital, was professor of the practice of medicine in London University from 1831–38. In 1838 he was compelled to resign the chair on account of his unauthorised support of mesmerism.—ED. L.

PUBLIC HEALTH

Annual Report of the Ministry of Health

THE annual account, addressed by the Minister of Health to the King, of the working of his department deals with the financial year—April 1st to March 31st—and the period under review thus does not correspond with the calendar year used by the chief medical officer in his special report to the Ministry. The report from the Ministry, for the year ended March 31st, 1937, which was published on August 4th, with creditable expedition, is concerned mainly with finance and administration, but contains much of interest to the medical profession. The year reviewed was the healthiest in the history of England and Wales, and so afforded Sir Kingsley Wood, whose optimism is as conspicuous as his energy, the opportunity of writing a cheerful foreword. Its kernel is that since 1919, when the Ministry of Health was formed, the standard death-rate has fallen from 13·0 to 9·2, the infantile mortality from 89 to 59 per thousand live births, and the death-rate of children between one and five years of age from 12·4 to 5·5. In 1936–37, maternal mortality sank to 3·81, the lowest it has been for fifteen years. Few will dispute the statement that "English men and women, and more particularly English children, enjoy a healthier and fuller life than at any time since the industrial revolution." None other of His Majesty's Ministers can report such progress in every direction.

The cost of the health services last year to the central government was £140,000,000, of which £75,000,000 was spent on health insurance and pensions. In addition to this sum local authorities spent £160,000,000 raised by rates, of which £50,000,000 went to public health services. So the total cost of health and pensions falling on public funds is about £5 per annum per unit of population. All the departments of the Ministry of Health show favourable returns compared with previous years. Deaths from pulmonary *tuberculosis* numbered 23,801 and from other forms, 4467, both low records, giving between them a death-rate from tuberculosis of 692 per million living; this is much the lowest we have yet touched. The death-rates from tuberculosis in the decade 1901–1910 were: pulmonary tuberculosis, 1143; non-pulmonary, 503. In 1935 the rates were: respiratory tuberculosis, 552; other forms (including laryngeal tuberculosis formerly included in the non-pulmonary division), 135. The Minister emphasised the need not for more, but for better facilities for tuberculous patients. Owing to the sharp fall in the disease, accommodation which was inadequate in the past is to-day sufficient in quantity, but its quality is not good enough, especially in view of improved methods of treatment now available.

On Dec. 31st, the notified cases of tuberculosis in England and Wales were 214,272 pulmonary and 93,735 non-pulmonary, a total of 308,007 in a population of just over 40 millions. We do not know how many cases which have escaped notification should be added to the list, or what percentage of those notified might be struck off either because they are cured, or because the diagnosis has been revised. It is satisfactory to hear that the number of radiological examinations made at the dispensaries in 1936–37—namely, 121,951—was double that of 1929, for abroad our service has been criticised for poverty of facilities for X rays.

The *venereal centres* show a slight drop in attendances, to 3,232,986, and as the percentage of cases found not to be suffering from venereal disease increased to 43, it is likely that the drop in attendance reflects a drop in incidence. There is much evidence that syphilis is decreasing; of particular interest is that whereas cases of congenital syphilis seen for the first time diminish steadily for ages below 15 years, there is a slight increase in new cases over that age. Of 1802 new patients in 1936, 888 were over fifteen years of age; in 1934, of 1870 cases only 787 were of that age. Gonorrhœa is not decreasing, so the proportion of gonorrhœa to syphilis rises steadily. In 1925 it was 1·6 cases of gonorrhœa, in 1936 it was 2·6 to each case of syphilis. The report suggests a reduction of syphilis in 1936 to 56 per cent. of what it was in 1920.

Notifiable diseases, the zymotic diseases of former times, had few features of interest in 1936. Twelve cases of variola major, eight of them in Oldham, were notified, but the minor variety which was prominent in the last decade has apparently died out completely. Notifications of *typhoid* fevers increased to 2493, the highest number for many years, but typhoid has been mounting steadily since the drought of 1934. Last year there was one major outbreak of typhoid on the south coast which supplied 718 notifications locally, and there is reason to believe that many cases notified in remote parts were connected with that outbreak. The south coast epidemic was milk-spread and is the most important milk-spread epidemic of true typhoid (Eberthella) in British history. Encephalitis lethargica continues to drop. The vaccination rate of infants fell to 35·4 per cent. in 1935 and conscientious declarations exceeded one-half of the live births. An imported case of yellow fever occurred in 1936, the first for over seventy years.

The chapter on *cancer* is short; no figures are submitted. We must wait for the report of the chief medical officer to learn the incidence of fatal cancer in 1936. It is believed that the gross incidence was the highest on record, but on standardisation will show little change from the past three years.

From the figures there appears to have been a great increase of *blindness* during the past few years, the number of blind persons having risen by 5455 since 1932; but a glance at the table of blind persons arranged according to age shows that the position is really satisfactory, for blind persons below 40 years of age diminished in the period by 625, whereas those over fifty increased by 5661. This suggests a decrease in the causes of blindness and a favourable outlook for the future. A brief paragraph on the *deaf and dumb* does not promise much hope of legislation for these unfortunates in the near future.

Maternity and child welfare showed considerable expansion in 1936, notably in the provision of schemes for the supervision of toddlers. The Midwives Act, 1936, came into operation on July 30th of that year, but activities did not start until July, 1937. Of great interest to medical practitioners will be the comparison of the working of the English Midwives Act of 1936 with that of the Scottish Maternity Services Act of 1937, for this will enable us to contrast two totally different systems of midwifery practice. Amongst diseases which are rapidly ameliorating is *ophthalmia neonatorum*, which continues to decline both in numbers and severity in spite of the continued high prevalence of gonorrhœa.

The section on *foods and drugs* shows that the population is eating more fruit and drinking more milk; but the average consumption of milk per person per

day is even now no more than half a pint. There was an increase of 662 in the number of licences granted for the production of tuberculin-tested milk; this is good, but not up to expectation. So far as the working of the Sale of Food and Drugs Acts is concerned adulteration seems to be now negligible, except for the watering of milk and spirits.

Those parts of the report which deal with the *sanitary services* and *housing* are satisfactory in so far as they record the purchase of 9059 acres of recreation ground, great progress in housing, and belated attention given to rural water-supplies.

An all-round improvement in *insurance practice* is indicated. The commissioners seem to have little cause for grievance with the way doctors carry out their side of the contract, for the faults found in the conduct of practitioners were few and in the main trivial. In 116 cases remuneration amounting in all to £866 was withheld from practitioners. The number of such cases is higher than usual, though the rate is not, for 1936 was an unusually busy year with 16 million contributors. There were only three cases of fees improperly charged, apparently only two of improper treatment and 21 of infringement of certificate rules. In only one instance was removal from the medical list considered and this was rendered unnecessary by an undertaking of the doctor not to engage again in insurance practice. Excessive prescribing still troubles the Minister. In the report this is treated as a purely financial matter, though perhaps the chief objection to excessive prescribing is that it is not good practice. The number of doctors engaged in treating insured persons was about 16,000, an average of one doctor per thousand potential patients. The doctors received £6,868,000 apart from mileage fees; this works out at an average income per doctor of £429. The cost of drugs and appliances paid to chemists was £2,084,600, and in addition £190,000 was paid to doctors for medicines dispensed by them in rural areas. The number of prescriptions issued was over 63 millions, an average of 4·72 per insured person.

WELSH BOARD OF HEALTH

The last part of the report is devoted to the work of the Welsh Board of Health and follows the same plan as the parts devoted to England. Good progress was made in the Welsh services in 1936. The maternal mortality was 5·17 which, though much higher than the rate in England, is the most favourable but one since 1926, and well below the average of the three preceding years which was 6·08. The death-rate per million from tuberculosis was 861, the first year on record in which it has been below 900. The King Edward VII Welsh National Memorial Association is a voluntary body which carries out the treatment of tuberculosis on behalf of the local authorities, for which the latter paid £259,000 in 1936–37. Under a new agreement this sum will be raised to £305,000 after 1940.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM F.R.C.S. (1936)

II

IT was a common teaching to us in the wards to lose no time in developing the senses. If a doctor had not by nature been endowed with the qualities of the hawk, then it was his plain duty constantly to devote himself to the development of the faculties, not omitting the olfactory. Our fellow passengers in tube or train were pointed out as excellent material upon which to practise the powers of observation. The idea took strongly amongst those who were able to recapture some of the past pleasures of beaver in spotting a Parkinsonian facies or facial palsy. My own results were disappointing. Complete visual examination of the clinic took only a few seconds of the half-hour journey and the bag was never very startling. On no occasion had I to worry about my social duty regarding the gentleman opposite with a lip chancre. More yielding in diverse return was a study of how fellow devotés of our tuppeny daily read their news. A three-year statistical study on the Central London line showed a clear majority for the lower corner of the back side of the sports page. On that railway I saw no performer of Dr. James's class shaping as though the cross-word were a task to be accomplished during the light-boiling of an egg. Only two further clear-cut results emerged from my observations: the first that on golf days Mr. Bernard Darwin was sure to prevent a large field from reaching the financial news before the Bank, and the second that I enjoyed alone my taste for obituaries in the early morning.

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There is a spaciousness in these reviews of past lives that does for me what Kruschen is said to accomplish for the outlook of the costive. In reading the many paragraphs extolling the great capabilities and high talents of an oriental Prince and the very short reference to the capricious nature and violent temper which led to his summary ejection from his domain, it is impossible not to feel that this is the broad and benign view taken by the deity or that this lofty perspective cannot fail to influence the ultimate judgment. It is said that to obtain the fullest savour from this column a certain seniority and a pencil are necessary, that then can be enjoyed the solid satisfaction of crossing off contemporaries as they show their inferior stamina.

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There are those who get their forecast of the future from the Personal Column whose lively imaginations, like Mr. Fleming's, can from a vacancy for two guns to share expenses, best references required and given, conjure the picture of two red-faced men at a bar saying, "What we need is a couple of suckers each with two hundred quid." Others who regard the Engagement Column as a list of stud bookings for the coming year may consider it a sounder basis for imaginative speculations on the future. Nor had I ever thought that this column was ever given more than the rapid scansion necessary to detect a familiar name warranting a congratulatory note. Last week in this innocence I announced my engagement. Just who are most interested in this column was soon apparent. One photographer must have studied the marriage forecast with his breakfast, for his circular arrived before lunch a mail ahead of a field of three florists, two furniture stores, and a shoemaker. In forty-eight hours the entry had risen to fifty, at this point there

was a sharp decline, and the mail has steadied to two or three a day for the last ten days. There is now nothing that the young couple might ever need which has not been illustrated in some elegant brochure. It has been pleasant to meet again those old friends in the photography business whose congratulations and gratuitous offers first appeared after the primary and subsequently punctuated my academic career.

The massed batteries of the furnishing trade are reserved for the female of the species, and no fire is wasted on the male. There was a uniform trust in the sales value of a coloured picture of a vast double bed set in a baronial hall. If the store also possessed a lingerie department the nuptial effect would be heightened by a hovering silk-clad nymph. For the rest there are few concessions to the occasion; the jewellers concentrate on plain rings of gold and platinum, food firms on wedding cakes and bewiskered pictures of the founder of the business, but most rely on a coronation rather than on a special nuptial display. Not all the mail is intended for both parties. One, an elaborate and heavily illustrated document about a breast supporter and corset, made no use of slogans to keep abreast of the times or to use a brassiere that really uplifts. It chose to rely on protection afforded against "cancer, tumour, inflammation, cysts, mastitis and pain." A devastating picture of a young lady supporting only one breast with their contrivance and labelled with and without was given much prominence. For further conviction a quotation, unhappily anonymous, from one of many Royal letters of thanks was reproduced. At this point orthodox advertising ceases. The contraceptive firms conduct their correspondence under a heavy personal seal and many long preambles about their reluctance to solicit unwilling clients. They beg to be excused this unorthodox intrusion on the grounds that usual methods of advertisement are denied them. Their politeness in this sphere is unique, although the enclosed accounts are couched in an irritating pseudo-medical jargon. The sound basis of one method advocated was possibly suggested in the subscription to a picture of the shop. It said "the public would admire the ingenious method employed to keep the sexes strictly apart." A more curious manifestation of the commercial mind is the attention given by the manufacturers of energising tablets to the names of those in the engagement columns. After several of these a wayside pulpit text arrived opportunely. It adjured the reader to "make it a stern rule of life not to be too critical."

In early '35 the blankness of the European horizon made the prospect of qualification contrast poorly with the opportunities of the early Georgian era. There seemed no lack amongst us of embryonic doctors who would welcome a return of the lively days when a picnic war in the Balkans provided for the enterprising a ready escape from hospital routine. Envy for this particular period was not infrequently stimulated by the personal reminiscence of a senior surgeon who told of rollicking fun with a private ambulance in Albania. The picture evoked was that of a jolly caravan trip through the Balkans punctuated by quantities of the most stimulating sort of Front Surgery work and frequent interludes for high jinks in Zagreb. There seem not a few about to receive their diplomas who given a similar opportunity would feel with the poet

> Let me like a soldier fall
> With my breast expanded to the ball!

True in Manchuria and in Paraguay internecine activities of the greatest vigour were being conducted. But they were scarcely the right sort; remote in the first place and quite lacking in any sporting element in the second. These surprising relapses into unrelieved barbarity required a very rare degree of idealistic fervour from the prospective doctor before they attracted him. There were few of us who regarded war as the Condy's fluid of the blood, and in those days there was completely lacking that "state of mind" which, the truism assures us, more than guns and bombs makes a war. But it did seem that given the proper opportunity there would still be many who would regard war through a cheerful miasma of sentiment and heartiness as the most exciting if the most dangerous of sports. Once the heroic qualities are given their old values it is easy for inexperience to offset the general theme of post Great War books and their insistence on its monotony, brutality, and futility, with the reflection that the persons most sensitive to that aspect of war are the most likely to write of it. Personal conflict tended to disappear during the Great War and with it that element of excitement and even pleasure which is said to accompany killing in the war "state of mind." Writers on older wars not infrequently used to make more of it and novelists, writing on the Crimea, had described their hero's unexpected delight in the pastime of bayonetting Russians. More recently that connoisseur of equestrian delight, Alphonso XIII, is reported as rating the cavalry charge high above pig-sticking. Experience of neither sport is necessary to feel that he has got the order right.

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Before any war might be expected to attract even the most swashbuckling of medical non-combatants a return of both the picnic and the accompanying personal conflict elements would seem to be necessary. The wars of the last two years have seen some return of personal conflict; and although the picnic element has been conspicuously lacking, dug-outs and mud have not occupied much space in the reports. It is easy, however, to understand Abyssinia not being a compelling magnet to the only casually adventurous. Addis Ababa was given no attractions to compensate for the penalty of being mistaken for an Italian by a wandering tribesman; all work and no play in that city seemed to alternate unhappily with no work and no play. In Spain, on whichever side of the wobbling boundary line the sick are tended, the relaxation of the warrior appears to be given its due importance. Except for Madrid, Spain from the press provides this year of grace with its equivalent to the Balkan wars of some quarter of a century ago.

* * *

It was with feelings of remorse, repentance, and regret, that the other day I overheard a library subscriber ask for books on war wounds, as he intended shortly to leave for Spain. Had two years of opportunity for work unobtainable elsewhere than on the battlefield and for a variety of other lively experiences been let pass? I took tally of those bolder contemporaries who, realising that at any one time there is only one spot on the globe where important things are happening, had chosen Spain. My acquaintance is not large nor representative, but an exhaustive tot up found me with personal knowledge of one medical worker in Spain, the journalist brother of a friend who enlisting to drive ambulances was last heard of as medical superintendent of a base hospital. It seems we are not the stuff our seniors were.

INTERNATIONAL HEALTH OFFICE

THE proceedings at the May session of the permanent committee of the International Health Office included consideration of new researches in cholera, yellow fever, epidemic encephalitis, tularæmia, bovine tuberculosis, and the deratisation of ships. The delegate for the United Kingdom was Dr. M. T. MORGAN of the Ministry of Health.

CHOLERA

For the rational prophylaxis of cholera it is essential to know whether vibrios isolated from carriers are true cholera vibrios capable of causing cholera. Some years ago the committee suggested that the following two questions should be the object of researches, in order to clear up this problem :—

(1) What are the characteristics of true cholera vibrios, and notably with what antigens should an agglutinating serum be prepared for it to be completely specific for the pathogenic vibrios ?

(2) Are vibrios which are not agglutinable by specific anti-cholera sera capable of causing cases or epidemics of cholera, and must they therefore be taken into consideration from the point of view of prophylaxis ?

The comprehensive researches carried out in India under the direction of the Consultative Committee for Cholera of the Indian Research Fund Association have thrown a light on these questions.

For these researches agglutinating sera of pure type O were used, obtained by injection of a rabbit with heated, dried antigens, furnished by Bruce White and Gardner. The strains employed were the original type Inaba and the type called "variant" of Ogawa, representatives of Group I of the classification of Gardner and Venkatraman. This vibrio possesses the fermentative properties for sugars which characterise type I of Heiberg : fermentation of mannose and of saccharose, no fermentation of arabinose. Its reaction to cholera red is positive, and the Voges-Proskauer reaction, modified by the addition of napthol-A is negative. It does not hæmolise goat's blood.

The two Japanese strains "Inaba" and "Ogawa" show all these biochemical characters, but from a serological point of view they have a distinct individuality. Thus for diagnosis two sera prepared respectively from these two strains, or more generally a bivalent serum, must be used.

The vibrios which are not agglutinable by O type serum cannot be classified into a small number of serological groups, and among the vibrios which had been isolated from clinical cases of cholera none was found in any series of cases from an epidemic outbreak. These vibrios thus do not appear to produce epidemics ; and for this and other reasons their introduction among the antigens used for the preparation of standard serum would not be justifiable. But certain vibrios possessing the characteristic biochemical reactions and inagglutinable by O type serum are agglutinated by serum O prepared from the "rough" form of the same strains. When a vibrio is agglutinated below the significant titre by "smooth" serum O it is thus necessary to try for agglutination with "rough" serum O.

Colonel Taylor's report tends to show that the vibrios which are not agglutinable by O type serum which have been isolated from clinical cases of cholera are not the true pathogenic agent responsible for these cases : the true cholera vibrio may have escaped discovery, and the non-agglutinable vibrio which had been isolated may belong to a type which is perhaps present in the intestine of a fraction of the healthy population.

Many of the strains which are not agglutinable by O type serum and which are not isolated from clinical cases of cholera show H agglutination. However, some vibrios isolated in the recent researches from clinical cases of cholera, of which some gave and others did not give typical biochemical reactions showed H agglutination only.

It seems then that in the actual state of our knowledge it is not yet possible to use O type sera exclusively for the diagnosis of pathogenic cholera vibrios.

YELLOW FEVER

Two special questions were examined in connexion with the danger of the spread of yellow fever. One relates to the measures applicable to persons making use of an international air line within the confines of a country ; this circumstance is comparatively rare and is generally governed by internal regulations ; but it was regarded as advisable to admit provisionally that the precautions laid down in Article 42 of the Convention might be required. The other question is that of aerodromes, normally used only for the purpose of refuelling and situated in regions in which, although there are no actual cases of yellow fever, such infection might exist. It was suggested that this particular class of landing place might be exempted from such of the conditions imposed in "anti-amaryl aerodromes," which are only required for the possible embarkation of passengers who might have been in contact with cases of yellow fever —e.g., screen quarters. In this way the very heavy costs to the governments concerned for the complete equipment of "anti-amaryl" aerodromes would be reduced. The Committee reserved this suggestion for closer examination at the next session.

With regard to methods of mosquito destruction, the committee considered those previously discussed, which make use of sprays with a pyrethrum base, as satisfactory if suitable doses are used. It does not recommend the use of hydrocyanic acid.

Continued researches in South America have confirmed the existence of the so-called "jungle" yellow fever in rural areas in which there are very few inhabitants and no *Aedes ægypti*. The problem lies in discovering other possible hosts than man and other blood-sucking vectors than the aedes. On the first point it should be noted that of 88 monkeys captured in yellow fever areas of Africa 20 have shown positive mouse-protection test, while this test has always been negative in monkeys coming from Kenya, as well as from India and Java. From a practical point of view there is unanimous agreement that in the "silent" areas in which protection tests are positive, an active search must be made to detect clinical yellow fever. In Great Britain vaccination against yellow fever has been performed with a pantropic virus attenuated by tissue-culture without the addition of immune serum. Observations made on 65 cases would seem to justify the use of the virus in this manner. It seems in particular that repeated passage through Rhesus monkeys does not increase the virulence and consequently a return to a virulent form need not be feared. It does not appear to be liable to become neurotropic. Experimental infection of mosquitoes by this virus circulating in the blood of humans or monkeys has not yet been effected.

EPIDEMIC ENCEPHALITIS

Epidemics of encephalitis occur in Japan more or less every year in certain prefectures. A commission appointed in 1933 to study this disease from all aspects has arrived at important results. The disease is similar to the so-called St. Louis encephalitis prevalent in the United States. It has been transmitted to monkeys by inoculation of the cerebral matter of dead persons, and then to the mouse which is the most receptive laboratory animal. The

virus can be maintained by passage through mouse brain. It is obtainable from the brain of patients only from the fourth to the tenth day of illness; the blood is virulent during the first days. Infection may take place by droplets of the naso-pharyngeal secretions; experimentally, infection has been produced by the nasal route. Mosquitoes (*Culex tritæniorhyncus*, *Culex pipiens*) which can remain infective for a month have been successfully infected by causing them to bite patients. Mice have subsequently been infected by the bite of these mosquitoes or by inoculation of ground-up mosquitoes. The infection of man by mosquito-bite has, however, not yet been demonstrated.

TULARÆMIA

Tularæmia has made its appearance in Central Europe and in Turkey in Europe. The first case in Lower Austria was notified in 1925 and the second in September, 1936, followed by about a hundred cases in the adjoining district on the Moravian frontier. Then the disease appeared in Southern Moravia at the end of October, 1936. Thirty to forty-five days before the first human cases, a great mortality was reported among field voles and then among hares. From Moravia the disease spread to the southern part of Slovakia. Up to April 15th of this year there were 391 cases in Czechoslovakia, of which 277 occurred in Moravia, 110 in Slovakia, and 4 at Prague (caused by hares coming from infected districts). The forms were glandular and ulcero-glandular, and occasionally typhoidal; there were also oculo-glandular forms, with slight ocular lesions. Contact with hares was proved in 90 per cent. of cases; the others were caused by contact with wild rabbits and mice. The initial lesion was sometimes a small skin wound, sometimes the mouth or throat, when the illness began with angina accompanied by extensive œdema. Notification of tularæmia has been made compulsory in Czechoslovakia. The sale and export of hares from the infected districts is prohibited and sick wild hares and rabbits must be destroyed and their carcasses burned.

In Turkey, the first cases were discovered in June, 1936, among soldiers in the garrison at Luleburgaz, in Thrace, and continued to occur up to the end of September; in all, there were 150 cases, 133 among soldiers and the others in villages sometimes far from the focus. The forms were generally glandular or oculo-glandular (32 per cent.); none were typhoidal. *Bacterium tularense* was isolated from human cases. The infection would appear to come from wild rabbits, but may have been transmitted by insects in some cases. As a diagnostic measure, agglutinating sera have been distributed in the district; convalescents and wild rabbits will be critically watched. The preparation of a vaccine and therapeutic serum is proposed. The source of origin of the disease in Turkey, as in Lower Austria, is unknown.

BOVINE TUBERCULOSIS

Since 1910 an active campaign has been carried on in the United States to eradicate bovine tuberculosis. The pasteurisation of milk is rapidly increasing, and tuberculous lymphadenitis has practically disappeared from the clinics and hospitals of the large cities. The tuberculin test is being applied to an increasing number of animals, those which react being slaughtered. In 1936, out of 22,918,038 animals tested only 0·7 per cent. reacted. For a sample of the population totalling 47,128,112 inhabitants, 87·5 per cent. of all the milk was pasteurised; but probably 40 per cent. of the total population, mainly in rural districts and small towns, still use raw milk. In cities of 500,000 inhabitants or more, 98 per cent. of all milk sold is pasteurised.

DERATISATION OF SHIPS

Observations made in many countries confirm the fact that fewer ships now have rats on board. Only a few (particularly, it appears, with mixed cargoes) still harbour rats to any considerable extent. The committee is persuaded that the normal application of the system laid down in Article 28 of the Convention of 1926 is sufficient to maintain this favourable situation, and that, except where actual danger to the port may arise from the condition of a ship the prescribed periods should normally be observed. These periods, when necessary, include the additional month allowed for *return to the "home port."* It goes without saying, however, that in order to have the advantage of this allowance, the return voyage should not *in fact* exceed one month.

THE MECCA PILGRIMAGE

A brief report on the general conditions of the pilgrimage of 1937 was presented by the President of the Quarantine Board of Egypt. The number of pilgrims in 1937 was much larger than that of the previous year; the sanitary condition in the Hejaz seems to have been very satisfactory and the pilgrimage could be declared "healthy."

In accordance with the provisions of the new Statute of the Health Organisation of the League of Nations, as previously ratified by the committee, the latter held on May 13th and 14th the first annual assembly of the Advisory Health Council of the League of Nations in which the delegates of Bulgaria, Hungary, and Liberia and a member of the International Labour Office participated, as well as the president and several members of the health committee and the Director of the Health Section of the League of Nations. At this meeting the work already done by the Health Organisation and work under consideration for the future were discussed.

VIENNA

(FROM OUR OWN CORRESPONDENT)

THE FIRST INTERNATIONAL SHORT-WAVE CONGRESS

OVER 400 scientists attended the first International Short-wave Congress held here during the second week of July. The honorary presidents were Prof. d'Arsonval, Senator Marconi (who has died since the congress), and Prof. Zenneck. The organisation of the congress was entrusted to Dr. Liebesny of Vienna. The meetings took place synchronously in three sections—on physics, with Prof. Thirring presiding, on biology, with Prof. Scheminzky, and on medicine, with Dr. Liebesny—and all were well attended. There was also in connexion with the congress a very interesting exhibition of historic and industrial importance. Only certain of the papers of medical or biological interest can be described here. Dr. Schliephake (Giessen), the pioneer in the subject, delivered a lecture on the Indications and Effects of Short-wave Therapy. He stated that purulent infections of the skin, the accessory nasal sinuses, the pleura, and the lungs were the chief field for their application. Dr. Maragliano (Genoa) has found short waves, especially when combined with X rays, useful in arthritic and

rheumatic disease. Prof. Wintz (Erlangen) has used them extensively in acute inflammations in gynæcological diseases, especially in hypofunction of the ovaries, with very satisfactory results. In the ensuing discussion numerous speakers were enthusiastic about the excellent effects of short waves in these conditions, but all stressed the necessity for weak athermic doses in acute conditions. In the section on biology this fact was explained in several papers dealing with the reaction of living tissues towards the high-frequency short and ultra-short waves. Thus Dr. Rajewsky (Frankfort) and Prof. Dalton (London) stated that their experiments tend to prove that the waves have a specific action upon tissue elements which cannot be attributed simply to a rise of temperature. Also Prof. S. Jellinek's paper on electropathology proved that the cell changes visible under the microscope after the application of short waves differ from those caused by the heat of electric currents. Short-wave therapy has been tried in many and varied pathological conditions. Thus Dr. T. Meyer (Paris) has used them in angina pectoris and Dr. Colarizi (Rome) in infantile paralysis. The latter treated 20 children, directing the waves to the cervical and lumbar portion of the medulla. Only the early stages seem to respond favourably; none of his patients died. Dr. H. Wolf (New York), Dr. Merdinges (Cernauti), and Dr. Wainder (Cracow) agreed with the claims for good results reported by the other speakers. Short waves have also been applied successfully in frost-bite, chronic appendicitis, and endocrine disorders. Prof. Ruete (Marburg) reported on their value in dermatology. He remarked on the good effect obtained by their use in the dangerous cases of nasal and labial furuncle, in pyodermia, and in axillary abscess. He has had unexpectedly good results in the intractable sclerodermia. Dr. Lux (New York and Vienna) uses them against rheumatism, especially when caused by oral sepsis or dental sepsis. He believes that formation of antibodies is thereby favoured, as has been proved in treating furunculosis. Chronic suppuration of the middle ear, especially that persisting after a radical mastoid operation, has been very favourably treated in Neumann's clinic by Dr. Löwy and Dr. Meller. Worse results were obtained in unoperated cases and in chronic catarrhal deafness; Buchband and Weissenstein had very good results in acute coryza. Ocular inflammations have been successfully treated by Gutsch (Berlin), Hausmann (Vienna), and trachoma by Krausz (Lodz, Poland).

In the biological section Dr. Raol (Berlin) reported on his experiments aiming at influencing the sex glands. Moderate doses of short waves, he found, do not injure the gonads, nor does irradiation of an embryo disturb its normal development, even during the period of maturation. Different results have however been obtained by irradiating germs and seeds of plants. Here distinct changes were found, varying according to the duration and intensity of the dose. Probably the thermic effect had also a considerable influence, but a specific action of the short waves themselves cannot be excluded. Dr. Liebesny stressed the point that high-frequency currents generally and short waves especially exerted their influence chiefly by non-thermic action. All sorts of electric currents have a specific action upon living tissues, short waves having it even in weak doses. It is important to prevent thermic action, especially in acute inflammations and in tuberculosis. Dr. Krasny-Ergen (Stockholm) could show that athermic short waves produce—in biological fluids or tissues—a regular chain-like apposition of smallest particles. If a very strong current is applied, producing heat, these regular lines are disturbed. Dr. Wolf explained how weak doses cause a dilatation of the capillaries, without increasing the flow in the arteries, whilst high doses paralyse the capillaries and increase the supply of blood with consecutive hypermia of the irradiated tissues. Dr. Weissenberg showed that short waves alter the electric resistance of the skin; high doses reducing it, low doses increasing it.

THE AUSTRIAN RÖNTGEN SOCIETY

Originally intended to be a purely Austrian affair, the second annual meeting of the Röntgen Society was attended by a large number of leading foreign radiologists, owing to the fact that the Short-wave Congress immediately followed it. Besides the 120 Austrian radiologists, 350 eminent scientists from 17 different countries took part in the proceedings and presented numerous interesting papers and contributions, so that this meeting also assumed the quality of an international congress.

The meeting confined its work to two main subjects —early diagnosis and differential diagnosis by X rays, and X ray therapy, especially in inflammatory conditions. Dr. Lenk (Vienna) discussed the problems of diagnosis in disease of the liver and spleen. He prefers to give the contrast medium by intravenous injection rather than by mouth. Prof. Sgalitzer (Vienna) emphasised the difficulty met in differentiating between inflammatory and neoplastic conditions of organs such as the brain or the alimentary canal. Repeated examinations may be required, and irradiation may cause an inflammation of the tissues to subside and thus facilitate the discovery of a tumour otherwise hidden. Dr. Vallebona (Genoa) explained his method of examining tissues at various depths which he calls stratography. Dr. Strauss (Vienna) demonstrated the telecord, an apparatus for prolonged observation of the heart contractions, separating systole from diastole. Dr. Fleischner (Vienna) pointed out that the hilum changes observed in pulmonary tuberculosis need not always be tuberculous, a fact also emphasised by Dr. Herrnheiser (Prague) and by Prof. Maragliano (Genoa). Cancerous and especially precancerous conditions of the alimentary canal have attracted the attention of many radiologists. Dr. Zdansky (Vienna) insists on the necessity of protracted observation before a definite diagnosis can be upheld. He said that as a rule the X rays cannot settle a diagnosis, but only assist the clinician in doing so, although, as Dr. Presser and Dr. Pape (both of Vienna) pointed out, the radiologist is more often fortunate in his diagnostic findings. Dr. Herzog (Ostrawa) discussed early diagnosis of kidney disease. He has convinced himself that calculi in the ureter or renal pelvis are more easily discernible during the attack of colic than in the quiet intervals.

The second theme—X ray therapy—was introduced by Dr. von Wieser (Vienna). He set out the biological principles of the action of X rays upon the tissues and explained why different methods may produce similar results. It is now accepted as a fact that inflammatory processes may be resolved and cut short by a proper dose of X rays. Prof. Wintz (Erlangen), on the therapeutic value of X rays in gynæcology, said that there were two methods—either to apply weak doses directly to the inflamed tissues, or to use stronger doses on the ovary, so as to interfere temporarily with its function and thus cause the inflammation to subside. Dr. Gajzago (Budapest) agreed with him and described some excellent results in acute mastitis. Other remarkable results with

irradiation were obtained in osteomyelitis by Dr. Palugyay, especially in the early stages; in paronychia by Dr. Spitzenberger, who prefers this method to that of operation; in cases of chronic tonsillitis by Dr. Windholz, whose results were often, he thought, as good as those of tonsillectomy. Dr. Frank even advised their use in acute tonsillitis with or without abscess-formation. Dr. Wochner has obtained excellent results in acute glaucoma. Operation could not always be avoided, but it rapidly alleviated the severe headaches. Dr. Hammer advises X rays as the best and most satisfactory treatment for all cases of neuritis and neuralgia; the effect is rapid and lasting.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

A BILL TO NATIONALISE PHYSICIANS

FOR some time the Federal Government has been putting pressure on various medical groups to develop medical practice plans along what might be described as more socialised lines. This pressure became more manifest at the convention of the American Association in Atlantic City early in June, when Senator Lewis spoke in closed session before the House of Delegates, giving there a message which purported to come from the President. On July 28th Lewis, who is the senior senator from Illinois, introduced into the Senate a Bill the significance of which cannot yet be wholly grasped. The preamble to this Bill is as follows:—

> "To provide medical aid for the needy,—and the stricken with illness who are unable because of poverty to provide treatment and hospitalization;—also to establish all licensed medical practitioners as civil officers of National Government."

Its most important provisions are that all physicians and surgeons who practise medicine or surgery in the United States or its territories would become federal civil officers; any such physician or surgeon, and any hospitals which render medical aid, would be authorised to make charges and submit accounts to the Social Security Board; it would be unlawful for any physician, surgeon, or hospital to refuse to render aid as provided; and it would be unlawful for any person fraudulently to represent that he is impoverished for the purpose of receiving this aid. The Social Security Board would have the power to make rules and regulations, and the Bill also proposes to authorise the appropriation of such sums as may be necessary to carry out its provisions. Finally there is a punitive provision that any person violating the regulations would be deemed guilty of a misdemeanour and upon conviction would be fined not more than $1000 or imprisoned not more than three months, or both.

There is apparently no likelihood that this Bill will be enacted into law, nor is there any expectation, even by its author, of this happening. It has apparently been introduced in the manner of many other recent proposals with the aim of gauging the attitude of the public and developing from that reaction a practicable programme of social security legislation. This Bill embodies, nevertheless, many proposals which have as yet received little attention in the more responsible legislative bodies. The licensing of medical practitioners as civil officers of the National Government is a new proposal.

There are, furthermore, many features of the Bill needing to be clarified before enactment would be reasonably feasible. The definition of "impoverished" is especially difficult in this country. Enormous differences exist between the economic and financial standards in some of the big cities as compared with outlying rural districts. Even though the Bill would authorise appropriations of money to carry out its provisions, the amount needed for this purpose would require extensive study if it is not to remain a matter of pure speculation. Its introduction would seem to be the first round in the fight between those who wish to use legal enactment to change the economics of medical care of the indigent, and those who would let such change develop by the natural evolution of trial and error. No doubt this particular Bill is stillborn but similar proposals will be introduced in later sessions.

PARIS

(FROM OUR OWN CORRESPONDENT)

PIRQUET-TESTING FOR ALL FRENCH CHILDREN

THE title of a recent report to the Academy of Medicine by Robert Debré and Marcel Lelong was "Treatment of the Initial Period of Tuberculosis in Childhood, Fundamental Element of the Anti-tuberculosis Campaign." One of their main points was that every child whose tuberculin reaction has just become positive should at once be assured rest. In this sentence special importance was attached by the speakers to the words *just become positive*, for the crucial fact is not the positive reaction in itself, but its recent origin. After the presentation of this report, the Academy unanimously adopted a resolution according to which the tuberculin skin test should be repeated in children as long as it is negative, at least once a year by the family doctor or, failing him, by the school medical officer. A certificate on this point should be required of every child at the beginning of each scholastic year, the change in the skin reaction being the sole certain means of detecting the onset of the primary infection in the child and of taking indispensable prophylactic and curative measures.

TYPHOID FEVER AND THE GENERAL PRACTITIONER

The recent discussion on typhoid fever, held in Paris under the auspices of the Assises Nationales de Médecine, reflected the opinions of general practitioners throughout France about this disease. According to a report issued to the medical press there is a widespread belief among French practitioners that typhoid fever has diminished greatly except in certain Mediterranean ports. A corrective to this cheery picture came from the chairman, Prof. H. Vincent, who reminded his audience that between 1919 and 1921 and between 1925 and 1933—a total of twelve years—there were 23,246 deaths from typhoid fever throughout France. Considering how defective notifications of the causes of death are, this figure must be taken as an under-estimate. While the efficacy of vaccination by injection was generally accepted, the voices in favour of vaccination by the mouth were certainly not unanimous. Much of the typhoid morbidity on the French littoral was held to be the result of shell-fish infections, and it was noted that while there are public health measures in connexion with oysters, the culture, distribution, and sale of other shell-fish such as mussels and cockles

are still unhampered by any official regulations. This is the more deplorable as the old custom of eating mussels raw is still in vogue, and the haphazard harvesting thereof is an avocation indulged in by all and sundry.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

EFFECT OF POISON GAS ON WATER

Dr. Albert Telbisz, a surgeon in the Hungarian army, in a public lecture on poison gas, said that although the subject has been very widely discussed little has been said about its effects on the water-supply. It is only recently that the importance of this question has been recognised, and intensive research is now in progress. It has been found that if a gramme of mustard gas enters the stomach of a horse, either in water or in the fodder, the animal dies in three or four days; 0·10 g. mustard gas is not necessarily deadly, but recovery may be prolonged. Gases containing irritating arsenical compounds cause similar symptoms.

Generally speaking, gases that act as vapours do not poison water, for they disintegrate and lose their properties. It is possible that an unusually large cloud of high concentration may act upon the surface of the fluid—usually milk or water—long enough for it to absorb so much gas that its consumption is dangerous. The conditions necessary to maintain such high concentration for several hours is only possible under exceptional conditions.

Mustard gas and certain other compounds, however, may make the water very dangerous for consumption, particularly in lakes or other standing water, while in rivers the dilution is so rapid and great that the possibility of poisoning can be excluded. In experiments Dr. Telbisz established that the greater part of the gas sinks to the bottom, but on the surface there is also a very thin, slightly opalescent layer. The middle part remains entirely free of the gas, and tests in animals proved that it is drinkable and quite harmless, but it is impossible to separate it from the upper layer. The presence of mustard gas in water is disclosed by its odour and colour. Upon the least suspicion it should be boiled, filtered through active coke, and left to stand for an hour. It can be rendered safe by treating it with eau de javelle or chloramine—6–7 c.cm. per litre. After this procedure the water has a slight odour of garlic, but it can be safely used. Water rendered poisonous by arsenic compounds or by lewisite cannot be consumed at all, and it should not be used even for washing.

VITAMIN C IN TYPHOID FEVER

At a meeting of the Budapest Royal Medical Society Dr. K. Farkas read a paper on the value of vitamin C in treating enteric fever. He regards the organism of typhoid as "hypo-ergic"—that is to say, it tends to produce hæmorrhage and leucopenia. The cause of these changes is to be found both in increased hæmolysis by the spleen and in partial avitaminosis. In typhoid cases he discovered very low values for the blood platelet count, and this may be of diagnostic importance, for it is low even if the blood picture is not otherwise characteristic. It is useful also in prognosis, the cases with a very low count having a bad outlook, particularly when it cannot be influenced by treatment. Farkas explains this as the outcome of hypovitaminosis, and therefore for typhoid in general, but especially in cases with very low counts he suggests the energetic administration of vitamin dosage. Of these he recommends vitamin C as most important, because of its effect on the evolution of infectious diseases and the reported action of vitamin C in increasing the platelets and the reticulocytes. His own cases confirm these facts and seem to show that ascorbic acid in proper doses may be valuable.

ENVIRONMENT OF THE NERVOUS CHILD

Dr. O. Joseph Vértes, late director of the secondary school for nervous children, says that a sick child should never see that he is the object of great anxiety or attention, for this at once makes him feel that he is an unfortunate. As soon as the interest and the condolences cease, the symptoms themselves may also disappear; by "neglecting" him one suggests to him that he is not seriously ill. Besides this it is also an important therapeutic measure to ensure that he observes a systematic daily routine, not being allowed to be idle even for a minute, and thus he is not allowed time even to think of being sick. The central factor, however, is the education of will, replacing weakness by a definite aim. But the difficulty is that among all the methods of the education of will there is not one about which it could be safely said that it would certainly be effective.

After the critical, economical, and financial stress of the post-war years the number of nervous children rose very sharply, and this height is maintained even now, 17–18 years beyond the end of the war. It can be established that in every secondary school the proportion of children who cannot be kept amongst normal children is at least 1 per cent. Let us select these children and let us open for them special institutes, says Dr. Vértes. The number of nervous children in Budapest amounts to 1200–1300. It would be profitable, he concludes, to provide for them a separate institution, because this is a question affecting the great men of the future, since he believes that it is only this type that develops the creative and inventive mind.

AERIAL AMBULANCES

The International Aerial Ambulance Conference in Budapest was held here in the second half of June under the presidency of Prince Bibesco, the official delegate of Rumania. There was also a demonstration of the aerial transport of the wounded, and an exhibition of equipment was held at the Mátyásföld airport. Among other things they showed how whole hospitals may be transported by aeroplane, how field ambulances, with physicians and nurses, may be landed in regions afflicted with flood, and supplying them with food, drinking water, drugs, dressings, &c., and how ropes may be taken to sinking ships. A Swedish and three French aeroplanes flew to Szeged, and returned with a "sick transport" to Budapest. One of the French planes 5 minutes after landing was again in the air with another load of patients. The most interesting part of the show was the landing by parachute of a physician and three nurses. The aeroplane flew to a height of 500 metres, and after circling dropped first the packages containing equipment, and then the personnel, who landed safely.

NEWTON ABBOT HOSPITAL.—The foundation-stone has been laid of the Webster memorial nurses' home at this hospital.

CORRESPONDENCE

CLINICAL EVIDENCE AND STATISTICAL PROOF

To the Editor of THE LANCET

SIR,—May I, as a clinician, be allowed to say a few words on the sub-heading of Dr. Howard Collier's letter in your issue of July 24th? I do not propose to blow my horn about the busmen's gastric disorders about which I know very little. I wish rather to question the main theme of Dr. Collier's letter—namely, that statistical analysis demonstrates "the reliability of clinical observation and the validity of clinical inference." The writer seems so convinced of this that one is almost given the impression that Dr. Bradford Hill has been wasting his time.

No one will deny that the accumulated experience of a shrewd clinician often leads him and those he teaches to something very near the truth—truth sometimes expressed in the most delightful aphorisms, for which we cannot but be grateful. More often than not, however, this judgment from experience is applicable only to relatively simple problems, and is very liable to err. May I give a few examples from my own experience. Most of us have been taught that in Pott's paraplegia "children always get better under conservative treatment; adults do not, so you must operate on them." Some years ago R. W. Butler and I analysed a large series of cases—and we found that the recovery-rate was almost independent of the age. We were astonished. Another example: "the prognosis in sacro-iliac tuberculosis is bad," though no one can say just how bad. Two other surgeons and myself are now engaged on an analysis of a large series of cases, and I can say with confidence that the prognosis is, at any rate, not too bad—probably good according to some standards. The exact figures will be available next year. One more: "the recovery period in infantile paralysis is about two years." Here we got into trouble some time ago, for one experienced orthopædic surgeon was sure that four years was nearer the mark; another equally experienced, said nine months. There was only one thing to do—namely, analyse a number of cases and find out. I now have the answer, which will shortly be published by the man who did the work, and it does not confirm the opinion derived *solely* from clinical observation.

The truth of the matter is that most of us detest statistical analysis and welcome any excuse for dispensing with it. I am sorry that Dr. Collier has tried to damp down the salutary stimulus administered to many of us by Dr. Bradford Hill in those excellent articles in your pages which have now appeared in book form. In clinical work we have our loves and hates. We like this operation, therefore our results are good; we dislike Smith's way of treating a certain condition, therefore it is bad. We rather fancy that A causes B—and lo! it does so. Only the cold impersonal evidence of statistics can dispel this emotional bias. We must learn how to tackle the more simple statistical problems ourselves and hand over the difficult ones to people like Dr. Bradford Hill who really know something about statistics and may, incredible as it may seem, enjoy such work.

I am, Sir, yours faithfully,

H. J. SEDDON.

Royal National Orthopædic Hospital, Stanmore, Middlesex, August 8th.

PASTORAL PSYCHOTHERAPY

To the Editor of THE LANCET

SIR,—I am sorry to have to descend to elementary facts but some who have written to you recently, and who apparently think that unqualified practice is desirable, seem unaware of them. To those who have benefited from a scientific education it is self-evident that science is an integration of a large number of component sciences so dovetailed together as to make the whole unassailable. One of these sciences is medicine and a part of it is psychotherapy. This accumulation of knowledge is the result of individual labours which have each added its microscopical or macroscopical contribution. It is apparent to any who care to study the history of any science that no one has ever contributed anything to it who has not had an adequate education in the basic principles which support the whole. Pasteur who burst so dramatically through chemistry into medicine was really a highly qualified chemist. It is not therefore from any personal sense of grievance that the qualified physician resents an inrush of the unqualified but merely that such an invasion cannot possibly advance knowledge and may easily retard it. What unqualified person has contributed anything of value to medicine? Compared with the sacrifices which have been gladly made by the qualified the history of quackery shows a sordid passion for notoriety and gain. (All this I had always believed to be obvious, but it is apparently not so to those who blind themselves with ignorant prejudice.) The right to any field does not depend on theories—whether it be the psychobiological theory or any other—but upon competence and the capacity to advance knowledge. It is obvious therefore that "the study of religion" cannot justify an invasion into scientific medicine or form a basis for psychotherapy as one of your correspondents suggests. The profoundest truths of psychopathology or indeed the whole of medicine *may* be found in the Gospels, but if they are not comprehensible or available as knowledge how can they replace the knowledge acquired in proper medical training? Dr. Hubble seems to have a great capacity for drawing conclusions with absolutely no evidence to support them. He accuses me of showing an "anti-religious bias." This I emphatically deny—nothing I have written could possibly convey such an idea (although I should show a similar reaction and might be accused of an "anti-legal bias" if the lawyers started practising medicine). I believe that there is plenty of noble work that the churches can do but they will not do it by competing with the osteopath, the cheiropractor, and the man who sells twopenny packets of cure-all pills in the market place.

Again Dr. Hubble dubs me a "thorough-going Freudian" which indeed I am not (although knowing Freud's contributions to medicine I cannot regard it as other than complimentary). Had he read the book I quoted in a previous letter he might have found that I have a great admiration for Pavlov and could be called a thorough-going Pavlovian with as much justification.

Both of your correspondents' letters show a certain childish animosity and contempt for the profession, which they seem to have in common with another who has written defending the Guild. It may be "fashionable" to encourage unqualified practice and to disparage one's profession but for myself I

am content to remain one of those quaint old-fashioned folk who refrain from doing so and still find it an honour to be a member of it.

I am, Sir, yours faithfully,

Harley-street, W., August 7th. CLIFFORD ALLEN.

THE OVER-TREATMENT OF GONORRHŒA

To the Editor of THE LANCET

SIR,—As I have been interested in this subject for many years permit me to add the following to the present correspondence on the subject. It is eleven years since I decided that modern treatment of gonorrhœa in the male was surgically unsound and that vasotomy was in every way to be preferred. The surgically unscientific character of the procedures of to-day has been stressed in this correspondence and Mr. Nicholls asks what are we to do about it. In a letter to your columns in 1928 (**1**, 883) I pointed out that the treatment was at fault and that the better remedy was vasotomy. In August of that year I argued the point more fully at the International Congress of Hygiene held at Dublin. More recently (*Med. World, Lond.* Dec. 13th, 1935) I exposed fully the unsoundness from a surgical standpoint of the procedure of to-day and the futility of massage of the prostate and seminal vesicles. My answer to Mr. Nicholls is as I wrote in 1928:—

"If my remarks . . . will induce the venerealogists skilled in surgical work to practise vasotomy in the treatment of acute gonorrhœa I am confident they will prove this treatment of acute gonorrhœa to be one of the greatest blessings of the day to afflicted mankind, and that the campaign against gonorrhœa, instead of being deemed as it is now to have failed, will be successful."

But, Sir, I have no doubt that in spite of the excellent results obtained by vasotomy many will consider the mere fact of operating as over-treatment.

I am, Sir, yours faithfully,

Upper Wimpole-street, August 9th. J. F. PEART.

RADIO-INTERFERENCE BY ELECTRO-MEDICAL EQUIPMENT

To the Editor of THE LANCET

SIR,—The Committee of the British Standards Institution is inquiring into radio-interference caused by electro-medical equipment. We have been asked to endeavour to obtain replies to the following questions:

(*a*) Has mechanical rectification any advantage over valve rectification in any particular cases, and, if so, what are the advantages, and in what cases do they arise?

(*b*) How far is it desirable apart from economic considerations to use spark apparatus for diathermy?

We shall be glad if any of your correspondents could give us any information that would help us to answer these questions.

We are, Sir, yours faithfully,

RUSSELL J. REYNOLDS,
GEORGE F. STEBBING.

Lambeth Hospital, Brook-street, S.E., August 5th.

UNDESIRED PUBLICITY

To the Editor of THE LANCET

SIR,—In view of my position as chairman of the British Pharmaceutical Conference held last week in Liverpool, and also of the fact that my company is one of the English manufacturers of *p*-aminobenzene-sulphonamide, I was a little concerned at the fact that a paper read by one of our research chemists, Mr. W. J. C. Dyke, M.Sc., was made on the following day the subject of headlines in many of the daily papers. In an interview published in the *Observer* of August 1st I have endeavoured to put the matter in its proper light. It is entirely contrary to the views of responsible manufacturers of products which are often the subject of considerable research that these products should be made the subject of anything in the nature of a popular stunt.

I am, Sir, yours faithfully,

T. EDWARD LESCHER,
Managing Director, Evans Sons Lescher and Webb Ltd.

Liverpool, August 3rd.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. E. MacEwen, O.B.E., to *President* for course.

Surg. Comdrs. T. G. B. Crawford to *Dorsetshire* (on commg.); R. Buddle to *St. Angelo*; W. E. Heath to *Curacoa*.

Surg. Lt.-Comdr. T. F. Crean to be Surg. Comdr.

Surg. Lt.-Comdrs. E. J. Mockler to *Sheffield* (on commg.); W. V. Beach to *Drake* for R.N. Hospl., Plymouth; H. L. Belcher to *Pembroke* for R.N.B.

Surg. Lts. L. R. Norsworthy to *Dorsetshire* (on commg.); W. S. Miller to *Challenger* (on recommg.); W. D. Gunn to *Pembroke* for R.N. Hospl., Chatham; E. R. Caldwell to *Victory* for R.N.B., and to *Enchantress*.

Surg. Lt. (D) W. A. Dickie to *Wildfire*, and to *Pembroke* for R.N.B.

N. L. Parry to be Surg. Lt. (D).

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. W. E. Pycraft to *Curacoa*.

J. A. Atkinson, entered as Proby. Surg. Lt. (D), and attached to list 2 of the Tyne Division.

ARMY MEDICAL SERVICES

Col. R. W. D. Leslie, O.B.E. (late R.A.M.C.), to be Major-General and appointed Deputy Director of Medical Services for the Northern Command at York.

ROYAL ARMY MEDICAL CORPS

Maj. S. Fenwick, M.C., is placed on the h.p. list on account of ill health.

Capts. to be Majs.: L. R. S. MacFarlane, H. A. Ferguson, and J. J. O'Dwyer.

Short Service Commission: Lt. (on prob.) J. A. V. Nicoll is restd. to the estabt.

ARMY DENTAL CORPS

Short Service Commission: Lt. C. O. B. Stibbs to be Capt.

TERRITORIAL ARMY

N. N. Porterfield (late Lt., New Zealand Mil. Forces) to be Capt. (Substituted for notification in *Gazette*, July 13th.) (*Vide* THE LANCET, July 24th.)

Lts. W. G. Brander and J. S. Minett to be Capts.

G. R. Mackay (late Offr. Cadet, Aberdeen Univ. Contgt. (Med. Unit), Sen. Div., O.T.C.) to be Lt.

E. N. Rees to be Lt.

Lt. M. A. Townshend (late R. Fus.) to be Lt.

ROYAL AIR FORCE

Flight Lt. S. B. S. Smith is promoted to the rank of Squadron Leader.

INDIAN MEDICAL SERVICE

Major-General E. A. Walker, C.B., has vacated the post of Director of Medical Services in India.

Lt. Gurbuxsh Singh relinquishes his temp. commn.

COLONIAL MEDICAL SERVICE

Dr. W. S. Haynes has been appointed Medical Officer, Kenya; Dr. A. W. H. Smith (Trinidad) becomes Medical Superintendent, Mental Hospital, British Guiana; and Dr. P. B. Wilkinson (St. Helena), Medical Officer, Hong-Kong.

OBITUARY

EDWIN SMITH, M.D. Lond.

THE death last week of Dr. Edwin Smith after a long illness removes a personality well known both to medicine and the public. For the past seventeen years he had served two of the largest metropolitan districts as coroner. Born at Melton Mowbray in 1870, son of an Inland Revenue officer of the same name, Edwin Smith was educated at Perth Academy and Dundee High School, entering St. Thomas's Hospital with an entrance scholarship in science. He went on to take a number of other scholarships and prizes, culminating in the Treasurer's gold medal before qualifying in 1892, when he held a house appointment at the hospital and demonstrated practical surgery while reading for his London degrees. He then built up a large general practice in Balham, where he was district medical officer to the L.C.C.

DR. EDWIN SMITH

At the same time he read for the Bar and in 1908 was called at the Middle Temple, and three years later became lecturer on forensic medicine and toxicology at St. Thomas's Hospital. He edited the medico-legal sections in the "Practitioner's Encyclopædia of Medicine and Surgery," and did a good deal of writing on medical evidence and workmen's compensation. His first appointment as coroner was as deputy for Westminster, and in 1922 he was placed in charge of North-East London and later of the Western District. As coroner he attracted notices by his frank comment on the treatment of sick people, but his criticism was directed rather towards the conditions under which patients failed to obtain adequate relief than against the individuals limited by these conditions. While he recognised the value of the confident outlook in recovery from illness, he had on occasion at inquests to warn Christian Scientists that they should consider where their teaching was leading them. Remarks on the home treatment of panel patients provoked a challenge on the part of insurance practitioners to meet them and justify what was regarded in newspaper headlines as his sweeping condemnation, but he refused the challenge, remarking that the issue could only be solved by an impartial inquiry. He was himself a vice-president of the National Medical Union and an honorary member of the Edinburgh Medical Guild. His insistence on the need to meet the growing dangers of motor traffic on the roads led him to make many practical suggestions for their avoidance, some of which have since been adopted. He spoke from long experience as he was one of the first men in the country to hold a driving licence and motoring remained his chief hobby, shared in his lighter moments with an aptitude for making objects of illusion which led him to join, and later to preside over, the Magic Circle. He was a keen violinist and treasured a fine example of a Testori fiddle. In 1910 he married Edith Catherine, youngest daughter of Mr. H. N. Dyer, who survives him with two daughters and a son who has recently qualified from St. Thomas's.

Sir Bernard Spilsbury writes: "When Dr. Edwin Smith was appointed coroner to the north-eastern district of London, to be transferred later to the western district, he had gained considerable experience as a deputy coroner. But he had also the great advantage of having been in practice as a medical man for many years, and he thus had a thorough understanding of the difficulties which can arise between doctor and patient, and which are so often ventilated in the coroner's court. Whilst he could be a candid critic of conduct which he regarded as detrimental to the interests of the patient, he was constantly engaged in court in explaining to the friends the difficulties under which the doctor laboured, and he was thus instrumental in removing many causes of misunderstanding. His gift of sympathy was one of Dr. Smith's chief assets as a coroner. It was seen especially when a suspected person gave evidence before him. The witness had every opportunity of placing his conduct in the most favourable light, and the coroner would often offer suggestions to the witness to help him out of a difficulty. As one of the earliest motorists Dr. Smith had a practical acquaintance with driving problems, and he was well equipped to deal with the often very difficult cases of road fatalities. He was kindness and courtesy personified, and he maintained the high tradition which is associated in this country with the office of coroner."

REGINALD FRANCIS JOWERS, F.R.C.S. Eng.

Mr. Jowers, who died on August 7th at Hove in his seventy-sixth year, had spent his whole life in Brighton, where he became a surgeon of wide reputation. Educated at Winchester and St. Bartholomew's Hospital, he qualified in 1885 and for several years held resident appointments at St. Bart.'s and the East London Hospital for Children. In 1888 he took the fellowship and in the following year was appointed assistant surgeon to the Sussex County Hospital, retiring as consultant in 1922 after 33 years' service. He was also consulting surgeon to the Victoria Hospital at Lewes, the Eliot Memorial Hospital at Haywards Heath, and the Brighton Home of Rest for Nurses. During the war he was attached to the 2nd Eastern General Hospital with the rank of lieut.-colonel, R.A.M.C. Early in his surgical career he described in our columns a case of perforated gastric ulcer successfully treated by laparotomy, and gastric surgery became his principal interest and the subject of several communications to the Brighton and Sussex Medico-Chirurgical Society, of which he became president. Mr. Jowers married in 1898 Violet, daughter of Leadham Hough, C.B.E., and leaves his widow with a son and four daughters. His recreations were those of the countryside, fishing, shooting, and golf.

MEDICAL NEWS

University of Cambridge

The Gwyneath Pretty studentship and the Nita King research scholarship have been awarded to Dr. J. Hart-Mercer.

University of London

The following have been recognised as teachers of the University: Mr. D. W. D. Northfield, teacher of surgery at the London Hospital medical college; Mr. R. C. Brock, teacher of surgery at Guy's Hospital medical school; Dr. R. W. B. Ellis, teacher of children's diseases at Guy's Hospital medical school; Dr. C. P. Symonds, teacher of medicine at Guy's Hospital medical school; Mr. A. E. Porritt, teacher of surgery at St. Mary's Hospital medical school; Mr. A. W. Kendall, teacher of surgery at King's College Hospital medical school; Mr. A. S. Moore, teacher of dental surgery at King's College Hospital medical school.

Prof. T. B. Johnston, who has held the University chair of anatomy at Guy's Hospital medical school since September, 1919, having been appointed superintendent of Guy's Hospital on the resignation of Mr. Eason, the chair has been replaced by a part-time chair to which Prof. Johnston has been appointed as from Oct. 1st, 1937. Prof. Johnston has relinquished the office of dean, and in his place Mr. T. J. Evans, M.A., has been appointed.

It has been decided to institute a University readership in biochemistry tenable at the Lister Institute of Preventive Medicine. It was also decided that students who have passed the B.Sc. (household and social science) examination be exempted from the second examination for medical degrees, Part I, and that those who have passed the M.B., B.S. examination be exempted from examination in pathology and bacteriology at the B.D.S. examination.

The University studentship in physiology has been awarded to J. P. Quilliam, of University College, and the University medal at the M.B., B.S. examination to H. W.C. Fuller, of King's College Hospital.

University of Glasgow

A course of six lectures on some aspects of medical ophthalmology will be given in the Tennent Memorial Building, Church-street, Glasgow, on Tuesdays in September and October at 4.30 P.M. On Sept. 7th and 14th Prof. A. J. Ballantyne will speak on hypertension, vascular sclerosis, and renal disease. On Sept. 21st and 28th Dr. John Marshall will speak on diabetes, and on Oct. 5th and 12th Dr. I. Chesar Michaelson will discuss diseases of the central nervous system. All interested are invited to attend.

Combined Hospitals University Entrance Scholarships

As a result of the examination held for the university entrance scholarships, offered by St. Bartholomew's Hospital medical college and Guy's Hospital and St. Thomas's Hospital medical schools, the following awards have been made:—

H. V. Morgan (Gonville and Caius College, Cambridge scholarship at St. Bartholomew's Hospital.
L. W. Smith (Sidney Sussex College, Cambridge), exhibition at St. Bartholomew's Hospital.
G. E. H. Enderby (St. John's College, Cambridge), scholarship at Guy's Hospital.
G. T. G. Thomas (Gonville and Caius College, Cambridge), exhibition at Guy's Hospital.
J. L. Pinniger (St. Edmund Hall, Oxford), scholarship at St. Thomas's Hospital.
M. G. Smith (Emmanuel College, Cambridge), exhibition at St. Thomas's Hospital.

A Pavlov Memorial

The large biological station being built at Pavlovo (formerly Koltushi) in memory of the late Prof. I. P. Pavlov is practically completed. The department of evolutionary physiology of the Leningrad branch of the All-Union Institute of Experimental Medicine is being transferred to Pavlovo, where it will be housed in a laboratory equipped with the most up-to-date appliances for research, directed by Prof. L. A. Orbeli.

The Royal Society of Medicine

The William Gibson research scholarship for medical women has been awarded to Dr. Nancy E. G. Richardson, who proposes to carry out research on carbohydrate metabolism in pregnant and lactating women in relation to the principles secreted by the anterior lobe of the pituitary.

St. Mary's Hospital

The Queen will open the new extension at this hospital on Wednesday, Nov. 10th. It contains 66 bedrooms, available for patients of moderate means in need of hospital treatment, and was in the main made possible by an anonymous donor, whose donations during the past few years for the new nurses' home and the new wing now amount to over £110,000.

Bristol Royal Hospital

When the amalgamation of the Royal Infirmary and the General Hospital is completed, the name by which the city's one great hospital will be known is the Bristol Royal Hospital. It is hoped that the Eye Hospital and the Children's Hospital will shortly join the two major institutions. It is hoped to effect the amalgamation without an Act of Parliament.

Fellowship of Medicine and Post-Graduate Medical Association

The following courses in preparation for the M.R.C.P. examination will take place: clinical and pathological evening course at the National Temperance Hospital (8 P.M., Tuesdays and Thursdays, Sept. 7th to 23rd, at 8 P.M.); chest diseases at the Brompton Hospital (5.30 P.M., Sept. 6th to Oct. 2nd); chest and heart diseases at the Royal Chest Hospital (8 P.M., Mondays, Wednesdays, and Fridays, Sept. 13th to Oct. 1st); neurology at the West End Hospital for Nervous Diseases (afternoons, Sept. 20th to Oct. 2nd). Courses in physiology and anatomy in preparation for the primary F.R.C.S. examination will be given from Sept. 1st to Nov. 22nd at 5.30 and 8 P.M. respectively on Mondays, Wednesdays, and Fridays. The following post-graduate courses have been arranged in children's diseases, suitable for the D.C.H. examination, at the Infants Hospital (Sept. 20th to 25th); plastic surgery (Sept. 15th and 16th); proctology at the Gordon Hospital (Sept. 20th to Oct. 2nd). A week-end course in ophthalmology suitable for general practitioners will take place at the Royal Westminster Ophthalmic Hospital (Sept. 25th and 26th). Detailed syllabuses may be obtained from the Fellowship of Medicine, 1, Wimpole-street, London, W.1. The courses are open only to members and associates.

Fourth International Pædiatric Congress

This congress will be held in Rome on Sept. 27th–30th, under the presidency of Prof. Spolverini. Three main problems of interest to pædiatrician will be discussed. The first, neuropsychic diseases in pædiatrics from the clinical and social points of view, will be opened by Prof. Jundell (Stockholm), Prof. Glanzmann (Berne), and Dr. Allen (Philadelphia), with Dr. Dingwall Fordyce (Liverpool) also taking part. The second, mineral and water metabolism during early infancy and its relationship to artificial feeding, will be introduced by Prof. Noah Morris (Glasgow), Prof. McQuarrie (Minneapolis), Dr. Spermasky (Moscow), and Dr. Czape (Budapest). The third subject is to be the problems of infantile tuberculosis, in three aspects: the modern study of the ultra-virus, introduced by Prof. Dufourt (Lyons), Prof. Cohen (Brussels), and Prof. Valtis (Athens); contagiousness on the part of the infant, by Prof. Wallgren (Gothenburg), Dr. Kissel (Moscow), and Dr. Capon (Liverpool); prophylaxis and therapy, by Prof. Noeggerath (Freiburg), Dr. Chester Stewart (Minneapolis), and Dr. Armand-Delille (Paris). In addition to the numerous communications and visits to the pædiatric institutions in the neighbourhood and to the monuments of ancient Rome, a tour has been arranged to Naples, Capri, and Pompeii, extending over three days, and following immediately the conclusion of the congress. Further information may be obtained from Dr. Leonard Findlay, secretary of the British committee.

Third International Congress for Medical Post-graduate Study

From August 21st–25th this congress will take place at Berlin. Further information may be obtained from the secretary, Prof. C. Adam, 7, Robert Koch-Platz, Berlin, N.W.7.

Kent Hospitals

Kent County Council is planning to spend £1,247,000 on reorganisation of the county's hospital services.

Cameron Hospital, West Hartlepool

The final plans for the extensions to this hospital have been submitted to the Ministry of Health and a grant of three-quarters of its cost has been made by the Commissioner for Special Areas.

Extension of North Middlesex Hospital

Middlesex County Council are considering proposals for the modernisation and extension of this institution on which it is proposed to spend £2,000,000. With the further 2000 beds to be provided it is said that the hospital will be the largest in the country.

Reedyford War Memorial Hospital

Lord Derby opened this hospital at Nelson on July 31st. The hospital is well equipped, and the nurses' home is a separate building. £20,000 has been raised for the hospital, over £6000 annual subscriptions being subscribed voluntarily by the workers.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

WEDNESDAY, August 18th.—3 P.M., clinical and pathological conference (surgical).

THURSDAY.—3 P.M., operative obstetrics.

FRIDAY.—3 P.M., clinical and pathological conference (obstetrics and gynæcology).

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetrical and gynæcological clinics or operations.

Vacancies

For further information refer to the advertisement columns

Adelaide, Institute of Medical Science.—Neale Research Pathologist, £900.

Altrincham, St. Anne's Home.—Res. Surg. O., £200.

Barnsley, Beckett Hosp. and Dispensary.—Jun. H.S., £200.

Bedford County Hosp.—H.S., at rate of £150.

Belfast, Royal Maternity Hosp.—Res. H.S., at rate of £100.

Birmingham Children's Hosp.—Res. Surg. O., £175.

Birmingham, Selly Oak Hosp.—Res. Gynæcol. and Obstetrician, £700.

Blackburn, Royal Infirmary.—Cas. O., £175.

Bradford City.—Asst. City Pathologist, £500.

Bradford Municipal General Hosp., St. Luke's.—H.P.'s and H.S.'s, each at rate of £150.

Bradford Royal Eye and Ear Hosp.—H.S., £180.

Bristol University, Preventive Medicine Department Laboratories.—Asst. Clin. Path., £400.

British Empire Cancer Campaign, 11, Grosvenor-crescent, S.W.—Studentship, £300.

Cardiff, King Edward VII Welsh National Memorial Association. Area Asst. Tuber. Phys., £500. Res. M.O., £350. Two Asst. Res. M.O's each £200. Also three Half-time Asst. Tuber. O.'s, each £250.

Carlisle City.—Asst. M.O. for Maternity and Child Welfare, £600.

Carlisle, Cumberland Infirmary.—Two H.S.'s, each at rate of £100.

Central London Ophthalmic Hosp., Judd-street, W.C.—Asst. Surgeon. Pathologist, £105. Also Sen. and Jun. H.S.'s, at rate of £120 and £100 respectively.

Chichester, West Sussex County Mental Hospital.—Third. Asst. M.O., £350.

Derby, Derbyshire Royal Infirmary.—Gynæcological H.S. and Emergency Anæsthetist, £150. Also H.S., £150.

Doncaster Royal Infirmary.—Cas. H.S., at rate of £175.

Dublin, Mercer's Hosp.—Hon. Visiting Surgeon.

Ealing, King Edward Memorial Hosp.—H.S. to Spec. Depts. Also Cas. H. S., each at rate of £150.

Eastbourne, St. Mary's Municipal Hospital.—Res. H.S., £150.

East Ham Memorial Hosp., Shrewsbury-road, E.—H.P., at rate of £150.

Erith U.D.C.—Asst. M.O.H. and Asst. School M.O., £500.

Folkestone, Royal Victoria Hosp.—Jun. Res. M.O., at rate of £120.

General Lying-in Hosp., York-road, Lambeth, S.E.—Jun. Res. M.O., and Anæsthetist, at rate of £100.

Glasgow University.—Lecturer in Pathological Biochemistry, £700.

Great Yarmouth General Hosp.—H.S., £140.

Guildford, Warren-road Hosp.—Res. Asst. M.O., at rate of £375.

Hertford County Hosp.—H.P., at rate of £150.

Hove General Hosp.—Jun. Res. M.O., £120.

Huddersfield Royal Infirmary.—Cas. O., at rate of £200.

Ilford Borough.—Asst. Dental Surgeon, £450.

Ipswich, East Suffolk and Ipswich Hosp.—H.S., £144.

Leamington Spa, Warneford General Hosp.—Res. Jun. H.S. and Cas. O., at rate of £150.

Leicester City Mental Hosp., Humberstone.—Deputy Med. Supt., £800. Also Third Asst. Res. M.O., £350.

Leicester Royal Infirmary.—Res. Anæsthetist, at rate of £150, H.S., two H.P.'s, Sen. Cas. O., each at rate of £125. Also Jun. Cas. O., at rate of £100.

Liverpool, David Lewis Northern Hosp.—Surgical Tutor and Registrar. Also Medical Tutor and Registrar.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Sen. Asst. to Med. Supt., £350. Also Jun. Asst. to Med. Supt., £225.

Lochgilphead, Argyll and Bute District Mental Hosp.—Res. Asst. M.O., £300.

Manchester, Ancoats Hosp.—Asst. Pathologist, £300 to £350.

Manchester City.—Deputy Med. Supt. for Abergele Sanatorium, £500. Also Second Res. Asst. M.O. for Baguley Sanatorium, £350.

Manchester, Duchess of York Hosp. for Babies.—Sen. and Jun. Res. M.O.'s, at rate of £125 and £75 respectively.

Manchester, Park Hosp., Davyhulme.—Sen. Res. M.O., £350.

Manchester Royal Children's Hosp., Pendlebury.—Asst. M.O. and Res. M.O., each at rate of £150.

Market Drayton, Cheshire Joint Sanatorium.—Res. H.P., £250.

Miller General Hosp., Greenwich, S.E.—Cas. O., at rate of £150. Also H.P. and H.S., each at rate of £100.

Nelson Hosp., Merton, S.W.—Res. H.S., at rate of £150.

Newcastle-upon-Tyne Hosp. for Sick Children.—Hon. Asst. Surgeon to Throat, Nose, and Ear Dept.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. Surg. O., £300.

Northamptonshire.—Temp. Asst. M.O., at rate of £500.

Norwich, Norfolk and Norwich Hosp.—Res. Surg. O., £250.

Nottingham Children's Hosp.—Res. H.P., at rate of £150.

Perth City.—M.O.H., £800.

Plymouth City General Hosp.—Jun. Asst. M.O., at rate of £250.

Plymouth, Prince of Wales's Hosp.—Hon. Aural Surgeon and Hon. Med. Reg. H.S.

Plymouth, Prince of Wales's Hosp., Greenbank-road.—H.S., at rate of £120.

Portsmouth Royal Hosp.—Fourth H.S., at rate of £130.

Preston and County of Lancaster Royal Infirmary.—Res. Surg. O., £300. Also H.S. to Eye, Ear, Nose, and Throat Dept., at rate of £150.

Prince of Wales's General Hosp., N.—Res. Jun. H.P. and two Res. Jun. H.S.'s, each at rate of £90.

Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Res. Anæsthetist, at rate of £100. Res. Anæsthetist and Dist. Res. M.O., at rate of £90. Also Asst. Res. M.O., at rate of £80.

Queen's Hosp. for Children, Hackney-road, E.—Res. M.O., at rate of £200.

Rhondda Urban District Council.—Asst. M.O., £500.

Rochdale Infirmary and Dispensary.—Second H.S., at rate of £150.

Rotherham Hosp.—H.S. for Ophth. and Ear, Nose, and Throat Depts., £150.

Rowley Regis Borough Council.—Deputy M.O.H. and Asst. School M.O., £600.

Royal Cancer Hosp., Fulham-road, S.W.—Two Asst. Radiologists, each £350.

Royal Eye Hosp., St. George's-circus, S.E.—Sen. H.S. and two Asst. H.S.'s, at rate of £150 and £100 respectively.

St. Leonard's-on-Sea, Buchanan Hosp.—Hon. Neurologist.

Salop County Council (Medical Inspection of School-children and Maternity and Child Welfare Schemes).—Asst. M.O., £500.

Sheffield Royal Infirmary.—Cas. O., £150.

Shrewsbury, Royal Salop Infirmary.—Res. Surg. O., £250. Also Res. H.S., at rate of £160.

Southampton County Borough.—Sen. Asst. School M.O. and Asst. M.O.H., £650.

Southampton, Royal South Hants and Southampton Hosp.—Cas. O., and Res. Anæsthetist and H.S. to Ear, Nose, and Throat Dept., each at rate of £150.

Southend Municipal Hosp., Rochford.—Asst. M.O., £325.

Southern Rhodesia Medical Service.—Government M.O., £600.

Staffordshire County Council.—Res. Asst. M.O. for Wordsley Public Assistance Institution, at rate of £300.

Staffordshire General Infirmary.—H.S., at rate of £200. Also H.P. and Cas. O., at rate of £150.

Stockport, Stepping Hill Hosp.—Res. Asst. M.O., at rate of £350.

Stoke-on-Trent, Longton Hosp.—H.S., at rate of £180.

Torquay, Torbay Hosp.—H.S., £175.

University of London, W.C.—External Examinership.

Victoria Hosp. for Children, Tite-street, Chelsea, S.W.—Locum Cas. O., at rate of £200.

Wakefield, Scalebor Park Mental Hosp.—Asst. M.O., £650.

Warwick, King Edward VII Memorial Sanatorium, Hertford Hill.—Jun. Asst. M.O., at rate of £250.

West London Hosp., Hammersmith-road, W.—Res. Anæsthetist, at rate of £100.

Weston-super-Mare General Hosp.—Res. H.P., £150.

Windsor, King Edward VII Hosp.—Res. M.O., £200.

NOTES, COMMENTS, AND ABSTRACTS

A CONSULTATION IN THE REIGN OF ANTONINUS PIUS

(FROM A CORRESPONDENT)

IT is always difficult to project ourselves into the conceptions of our ancestors, and notably is this the case with their ideas about the relationship and functions of arteries and veins. He who will read the first few pages of Harvey's "De Motu Cordis," in which he reviews some of the doctrines held on this subject by his predecessors, will, I fear, not be materially enlightened on the question, for in truth the conspectus which he affixes as a preliminary to his own examination of the facts is a confused and vagrant piece of writing, quite unlike the vivid terseness which he employs to express his own experiments and conclusions. Yet if theory was defective among the ancients practice distinguished sharply and efficiently between the functions and uses of arteries and veins, as the episode related by Aulus Gellius in his Eighteenth Book goes to prove.

"In the height of summer I had left Athens for the country house of Herodes at a place called Cephisia. There I was confined to my bed by a sharp attack of fever with acute diarrhœa. The philosopher Calvisius Taurus [whose pupil at Athens Aulus Gellius at that time was] with some of his followers came out from Athens to see me and found the physician who was attending me sitting at my bedside. He related to Taurus the symptoms and progress of my disorder and in the course of conversation remarked that I was already improving; saying to Taurus 'You can satisfy yourself of this ἐὰν ἅψῃ αὐτοῦ τῆς φλεβός, which in Latin certainly means 'If you will put your finger on his vein.' The learned scholars who were with Taurus were shocked at the ignorance which could call an artery a vein and regarded him as a very inefficient physician. But Taurus observed quietly: 'I am sure, Sir, that you know very well the difference between arteries and veins; that the veins do not pulsate and are examined only for the purpose of blood-letting, while the arteries show by their movement and pulsation the height and degree of the fever. You did not of course speak in ignorance but only followed the everyday usage, for I have known many men who use the two words erroneously. I venture to believe that you are a better doctor than philologist, and will cure your patient well and quickly.'

"After this conversation I began to reflect that not only physicians but any intelligent layman ought to make himself acquainted with the more obvious facts of the structure and functions of the body, and devoted my spare time to dipping into medical books. From them I learned much in the way of practical general knowledge, and in regard to arteries and veins what I should express in the following terms. A vein is a container, ἀγγεῖον the doctors call it, of blood intermixed and combined with the breath of life, and there is less of this in it than of blood: an artery is a container of the breath of life intermixed and combined with blood and in it there is more of the breath of life and less of blood. Pulsation is the natural and spontaneous expansion and contraction in the heart and arteries. The old Greek physicians gave the definition thus: Pulsation is the spontaneous diastole and systole of the heart and arteries."

I have given a somewhat abbreviated version of Gellius's remarks, but I hope that I have preserved the charm of the picture of the Greek sage with his class holding a consultation with the general practitioner at the bedside of a favourite pupil. It is clear that the ancients attached considerable clinical importance to the study of the pulse which they rightly regarded as a good indication of the state of bodily health. The translation of the definition of a vein and an artery is rendered difficult by Gellius's use of the term "spiritus naturalis." I have called it "the breath of life" but to the Greeks and after them to the Romans it connoted rather a vital essence which pervaded the body mixing with its substance and its humours. One other point is interesting. Gellius says he learnt from the medical books much "non ab isto humanitatis usu aliena." In this phrase he uses the term "humanitas" in the same sense in which the Scotch still speak of the "humanities": meaning as he says elsewhere "education and training in the liberal arts."

MASCULINE AND FEMININE CHARACTERISTICS

WHEN we speak of a given person as being masculine and of another as feminine in type, the words have a definite meaning; yet the characteristic to which we refer is not reducible to a single or readily measurable feature of mind or body. It is rather a composite picture. Why should we say that a certain man makes upon us the impression of being very masculine? He might have a deep low-pitched voice, a vigorous growth of hair on the face, a muscular and tough physique with a strong development of chest and shoulders. Or, in more elusive ways, his character might suggest masculinity; he might be strong and silent—a being who preferred action to words; he might be indifferent to pain or hardship, physically courageous, aggressive and difficult to intimidate or to deflect from his purpose. He might be a natural leader—a type whom other men readily follow. Or he could be judged by his interests. These might be centred in sports and mechanical things rather than in personal matters; he might be lacking in vanity and indifferent to what other people thought about him. The picture could be supplemented in numerous other ways, and a similar list of typically feminine characteristics could likewise be compiled.

On reflection, however, it will be recognised that every one of these features with the exception of those pertaining to the secondary sexual characters might, taken singly, be possessed by a person of the opposite sex who, taken as a whole and judged in the light of the total personality, might be regarded as typical of that sex. In short, though we are in no doubt as to what we mean when we speak of a man being of a masculine or a woman of a feminine type, the quality we are describing is almost impossible to fit in to a simple formula or single measurable characteristic. But the difficulties of the subject have not deterred investigators from trying to reduce it to quantitative and metrical terms. Lewis Terman and Catharine Miles believe that it is possible to assess a person's degree of masculinity or femininity by means of an index figure or rating comparable to that by which his intelligence is expressed. In a considerable volume [1] which contains no less than 92 tables and several graphs, wherein we hear much of correlation-coefficients and standard deviations, they describe the evolution of tests elaborated for this purpose during the last 12 years and their application to large and heterogeneous groups of people.

A close study of these tests does not convince us of their value. The mathematical elaboration of their results gives an appearance of scientific accuracy which is clearly misleading if the tests themselves are badly conceived and if they fail to differentiate the essential characteristics under investigation. The tests used are questionnaires, the answers to which are

[1] Sex and Personality. By Lewis M. Terman and Catharine Cox Miles. London: McGraw-Hill Publishing Co. Pp. 600. 25s.

supplied by underlining or encircling one of three or four possible answers. We are told that each of the items has been selected by reason of its proved reliability in recording sex differences. There is no time limit, but the test can be carried out in 40 or 50 minutes, and is designed only for persons above a certain level of intelligence—the seventh grade, according to American scholastic standards. The purpose of the tests was concealed by the title "Attitude-Interest Analysis," their real object being unsuspected by the subjects tested.

The first is based on the principle of word-association. A key word is followed by four others in ordinary type, and the subject is asked to underline the one which, for him, associates most immediately or appropriately with the key word, thus: *Brace*: bit; pair; strap; support. Boys and girls, men and women, are said to associate differently to these four words. To underline "bit" is evidence of masculinity and the other words suggest femininity. The test contains 60 such word-associations. Some of the words supplied are "neutral"; for example in the set *Devil:* dare; evil; hell; tempt, "hell" is a deemed masculine response, "evil" and "tempt" feminine, and "dare" neutral. One wonders why the neutral words were included.

The second sub-test makes use of the ink-blot technique; a series of 18 blots are given and to each is appended four possible responses. This test, we are told, was of little value. It does not seem to have occurred to the authors that *none* of the association-words may strike the subject as appropriate. His answer may be quite lacking in spontaneity and yet receive the same consideration as the spontaneous ones given by others.

The third and seemingly least rational test is described as an information test. Masculine and feminine people are supposed to have different interests and therefore to have different equipments of general knowledge.

The fourth test which relates to emotional attitudes strikes us as being the most sensible and, in practice, it is said to have proved the most useful. Four emotional reactions (anger, fear, disgust, and pity), an ethical response test, and a preference test are included. The subject is asked to indicate whether he would react very much, much, little, or not at all, to various provocative situations. Here are instances. *Anger:* hearing your friends unjustly abused; seeing a person treated unfairly because of his race. *Fear:* being alone at night; ghosts; toads; becoming crippled or totally disabled. *Disgust:* dirty neck or ears; sight of anyone vomiting; words like "belly" or "guts." *Pity:* bird with a broken wing; a toad being swallowed by a snake; an underfed horse. In the test of ethical responses, various actions are enumerated and the subject is asked to record whether he considers them extremely wicked, decidedly bad, somewhat bad, or not really bad. Instances are stealing a dollar from your mother's purse; being an atheist; receiving wrong change when it was in your favour. In the preference test, the subject is asked to state which of two things he likes best, or to indicate that he has no preference. Instances are interesting work with a small income; uninteresting work with a large income; work with men; work with women. It is believed that women's affective reactions are generally more intense than men's. Women are more prone to strong reactions of anger, fear, disgust, and pity; their moral judgments are more censorious; their preferences are for passive rather than active occupations; they set greater store than men on outward appearance; they require less variety in their lives and acquisitive motives play a smaller part than in men. Another test is concerned with interests. The subject is asked to record whether he would like, dislike, or be indifferent towards a series of occupations; if he likes or dislikes certain types of people; or certain activities or recreations. Unfortunately, it is not made clear whether the like or dislike is supposed to have been experienced in youth or in maturity. One might, for instance, have enjoyed the "Biography of a Grizzly" at 14 and found it tedious at 40. Among questions asked are: suppose you were an artist, would you like to draw: clouds, cats, children; or horses, ships, and ruins. Suppose you were a newspaper reporter, would you like to write about or report: accidents, sporting news, and crimes; or new books, musical events, or social news. If you had two years in which to travel and plenty of money, would you like to: visit battlefields, visit the Chicago slaughter-house, hunt lions in Africa; or visit the Holy Land, study social customs, and see London Bridge.

There are other sub-tests, but we have quoted enough to show that such tests are not likely to find favour in this country, and it seems questionable whether anywhere their results are worth the elaborate mathematical treatment which they here receive. In favour of the tests, the authors claim that passively homosexual men register very feminine scores. If objective criteria of masculinity and femininity are being sought, surely physical characteristics such as the distribution of hair, vocal pitch, and body shape should also be considered.

RADIOTHERAPY IN CANCER OF THE CERVIX

THE Health Committee of the League of Nations has decided to issue a series of annual reports on the results of radiotherapy in cancer of the uterus, showing the results obtained when agreed rules for compiling the statistics have been observed. The reports will be edited by Dr. J. Heyman of Radiumhemmet, Stockholm, with the help of Dr. A. Lacassagne, of the Radium Institute of the University, Paris, and Lieut.-Col. A. B. Smallman, of the Ministry of Health, London. This advisory committee may invite the collaboration of institutes and clinicians throughout the world, and in publishing its first annual report[1] recognises that it must necessarily be experimental, serving as a guide for future work. It has consequently restricted the statements included in the report to the clinics and countries that were associated with the earlier work of the Health Committee. This first report is concerned only with cancer of the cervix, but the question of widening the scope of future reports so as to include, for example, analyses relating to the corpus uteri and the vagina is under consideration.

In discussing the sources of error in the statistical assessment of the result of treatment the report says that the chief of these are due first to the smallness of the samples for analysis, and, secondly, to the difficulty in comparing the clinical material analysed at the various clinics, some receiving for treatment unselected material, while in others there is a varying degree of voluntary or non-voluntary selection. In order to meet the difficulty caused by the smallness of the samples, the following procedure has been adopted: Percentages are not calculated in samples containing fewer than 15 cases, those of 15–100 cases are printed in ordinary type, and over 100 in heavy type.

These two sources of error must be reduced to a minimum before it is possible to assert that differences between the results at the various clinics are due to the different methods of treatment. In comparing the figures given in this first report, the above sources of error should be kept in mind.

The committee expect collaborators to observe certain rules about cases that should be included in the statements, and two series of tables and relevant notes have been submitted, aiming at a uniform method both of presenting the material and of calculating the result of treatment. The first of these is intended for the annual statements on cases treated in 1930, the second for indicating the results obtained at an earlier period.

The report has been printed in English and French, the official languages of the League, and the bulk

[1] League of Nations Publications. George Allen and Unwin. 1*s.* 6*d.*

consists of the collaborators' results in 1930 and previous years. Statements have been submitted by: the Centre des tumeurs de l'Université de Bruxelles, Belgium, contributed by Prof. J. Murdoch; the Liverpool Radium Institute, by Dr. P. Malpas; the Marie Curie Hospital, London, by Dr. Elizabeth Hurdon; the London County Council's Radium Centre for Carcinoma of the Uterus, by Sir Comyns Berkeley; the Institut du Radium de l'Université de Paris, by Dr. Lacassagne; and Radiumhemmet, Stockholm, by Dr. Heyman. The committee invites directors of clinics and others interested in this subject to communicate with Dr. Heyman with a view to their future participation.

PROBLEMS OF HEALTH AND INDUSTRY

A SERIES of lectures given by Sir Percy Alden, on subjects which specially concern the Ministry of Health, has been reprinted with a survey of the problems of industry in general and of coal and agriculture in particular.[1] The importance of child nurture is emphasised as the most important of all State functions, and an account is given of what the government and local authorities are doing, and still have to do, in recognition of this responsibility. Both in this connexion and in relation to the adolescent and adult, stress is laid on the paramount factors of ample and properly balanced feeding and physical training. As ancillary and closely related circumstances, housing and social security—including health and unemployment insurance—are dealt with separately. The problems of industrial development and organisation, which are much less clearly defined and understood, are explained and discussed in the last four chapters.

The merit of the work is that it is the product of a mature mind which has been engaged for many years not only in the contemplation of social problems here and abroad, but also in the practical application of progressive ideas to legislation and local administration. On the whole, Sir Percy Alden seems to be satisfied with the trend of modern social service and industrial organisation. At least, he expresses no serious dissatisfaction with our national policy, although he does comment on the defects of the insurance medical service. While this series of lectures is not and was clearly not intended to be very profound, its publication provides in convenient form a survey of the most important social issues with which civilised people are faced, and furnishes, especially in the chapters on industry, facts which are not accessible to the non-specialist reader.

A NORWEGIAN GOITRE SURVEY

ON the map, Norway looks like one vast seaboard so deeply indented by fjords that it is a little difficult to conceive of isolated, inland areas enjoying none of the benefits of proximity to the sea. Yet there are such areas, and one of them, Modum in the county of Buskerud, has of late become so notorious as a goitre centre that on the initiative of Prof. Johan Holst and Dr. Sverre Kjölstad it was subjected to a goitre survey in 1934 and 1935. The team responsible for this survey have now published their findings in *Norsk Magasin for Lægevidenskapen* for July, 1937. The clinical field work and the laboratory analyses in Oslo entailed expenses which were borne by several public bodies including the Nansen Fund.

Altogether 4560 of Modum's 11,400 inhabitants were examined, the school-children being examined in the schools and the rest of the population by a house-to-house visitation. Hunziker's system of examination was adopted, the height of each lateral lobe of the thyroid and the horizontal limits of the whole gland at its widest being measured. Enlargement of the thyroid was found in 65·6 per cent. of the total. It was demonstrable in 78 per cent. of the poorer families. The farmers were worse off in this respect than industrial workers, the incidence of goitre being 72 per cent. among the former and only 58 per cent. among the latter. This comparative immunity of the industrial workers was connected with the fact that over 63 per cent. of them ate fish at least once a week, whereas only 15 per cent. of the occupants of the farms did so. The fish-eating component of the community was far better off than the non-fish-eating component as far as the frequency of goitre was concerned. The women were worse off than the men, 73 per cent. of the former and only 57 per cent. of the latter being found to suffer from goitre. The highest goitre-rate was found in women who were between the ages of 20 and 29, and who lived on farms. The women who had borne children suffered more frequently and from larger goitres than did nulliparæ. The analyses of urine, drinking-water, milk and eggs both in Modum and Oslo showed that the iodine content of the urine and drinking-water was considerably higher in the latter than in the former. Discussing the prophylactic measures to recommend, the authors of this survey discuss the comparative merits of introducing an iodine-containing table salt (the *Vollsalz* used in Switzerland) or a comprehensive revolution in the dietary of the community, with the import of sea fish, feeding cattle with seaweed, and the use of seaweed as a manure. As the effects of such a revolution, if it could indeed be effected, would be slow, the simpler and shorter cut to health with an iodine-containing salt is in their opinion the wiser course.

CUTANEOUS EPITHELIOMA IN AN ALBINO AFRICAN

NOWHERE is the protective influence of the pigment of the skin more evident than in albino Africans in the tropics, and they suffer severely from solar dermatitis. As albinism is comparatively rare, however, the graver effects of chronic sunburn, so well known to Australian dermatologists, are uncommon. Dr. W. A. Bullen[1] of the Kenya Medical Service has recently reported a case of cutaneous cancer occurring in an albino woman of the Teita tribe aged about 25.

The patient is a deaf-mute and mentally defective. She is the youngest of a family of ten, and the only one to show albinism. The father and mother, and the patient's only child, were of the normal black colour. The infant died at the age of four months, apparently from marasmus. The patient is a complete albino and shows all the classical signs of that infirmity. The Wassermann reaction was negative.

When first seen in November, 1936, she complained of severe irritation of the skin upon which there were numerous red unbroken patches. On some of these patches horns had developed. There were also three "septic" ulcers, the largest of which was on the right side of the forehead. This ulcer was said to have followed the removal of one of the "horns" by the patient. By February, 1937, there were many more horny excrescences upon the trunk and some of them were ½–¾ in. in length. The ulcer on the forehead became more and more infiltrated and by April had developed into a large ulcerating tumour extending from the hairy margin of the scalp to the right orbit. Later it was found to have invaded the frontal and nasal bones. Until the last month there were no palpable lymphatic glands, but by the middle of April there were evident metastases in the cervical, pre-auricular, and suboccipital regions. A small ulcer on the back showed infiltration suggestive of malignancy.

A portion of the large tumour and one of the horns were sent to the Medical Research Laboratory at Nairobi, and Dr. F. W. Vint, senior pathologist, reported that the large growth was a squamous-celled carcinoma, but that the base of the cutaneous horn showed no evidence of malignancy.

A similar case was described by T. F. Hewer[2] of the Sudan Medical Service. His patient was a

[1] Aspects of a Changing Social Structure. Sir Halley Stewart Lecture, 1936. By Sir Percy Alden, M.A. London: George Allen and Unwin. 1937. Pp. 190. 4s. 6d.

[1] *E. Afr. med. J.* 1937, **14**, 80.
[2] *Brit. J. Derm.* 1932, **44**, 469.

nomad Arab male, 35 years old. In this instance the cancers were multiple, and one of them was found on microscopical examination to be a squamous-cell cancer and another of the basal-cell, or rodent, type. "Solar epitheliomatosis" was first described by W. Dubreuilh[3] in 1907, but by far the largest number of cancers due to chronic sunburn have been reported from Australia, by Norman Paul[4] and others.

PSYCHO-ANALYSIS IN LONDON

THE Institute of Psycho-analysis was incorporated in 1924, and in 1926 founded a clinic where psycho-analytical treatment (using the term in the strict Freudian sense) has been given to out-patients of the poorer classes, and students have been trained on hospital lines. The staff have given their services without payment and with great enthusiasm: every member has treated at least one patient daily, and many have treated more. The clinic has evolved very gradually as funds have become available, and has many plans for execution when means allow. Paid assistants would enable much more work to be done and more young psycho-analysts to be trained. The present work with children must in time be expanded into a regular children's department, and a paid officer to do the work of secretary, librarian, and registrar is perhaps the most immediate need. Reporting on the work for the last ten years, the directors say that 738 patients have come for consultation, nearly half of them between 20 and 30 years old. The commonest complaint was anxiety hysteria, and after it obsessional neurosis, but nervous disorder of all kinds has been represented. After unsuitables had been weeded out, nearly 600 were placed on the waiting-list, and of these 176 have been treated. Nearly two-thirds of those to whom treatment was offered refused it, for various reasons familiar to psychotherapists, perhaps the chief of which was the tragic one of the long delay before it could be started. Freudian standards are very arduous, and the medical director does not regard a report on a case as useful unless more than 100 treatments have been given. Out of 31 cases of hysteria the results were quite satisfactory in 8 by both analytic and therapeutic standards. Analytical progress was satisfactory in 12, and therapeutic progress in 13. In only 1 case could no progress of any kind be observed. The results in obsessional neurosis were quite satisfactory from both aspects in 3 cases out of 17. Very satisfactory analytical progress was made in 7 cases, therapeutic progress in 8. In both hysteria and obsessional neurosis analytical and therapeutic progress often went hand in hand. The Institute has promoted a number of valuable public lectures, and its library has accumulated a respectable collection of the literature of this difficult subject.

Appointments

MARTIN, P. H., M.R.C.P. Lond., D.T.M. & H., Pathologist to the Hospital for Tropical Diseases, London.
MATHESON, LOUISE ALICE, M.B. Birm., Assistant Woman Medical Officer of Health for Wembley.
MURGATROYD, FREDERICK, M.D. Liverp., D.T.M., Assistant Physician to the Hospital for Tropical Diseases, London.
MURRAY, W. A., M.D. Glasg., Medical Superintendent to the Ayrshire Sanatorium.
O'SULLIVAN, T. J., M.D. Dubl., Assistant County Medical Officer of Health for Kesteven.
SMYTH, M. J., M.Ch. N.U.I., F.R.C.S. Eng., Consulting Surgeon to Beckenham Hospital.
WRIGHT, Col. ROBERT, M.D. Dubl., D.P.H., Ophthalmic Surgeon to the Hospital for Tropical Diseases, London.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I) or (II) = Assistant Medical Officer, Grades I or II; D.M.O. = District Medical Officer; Med. Supt. = Medical Superintendent; Temp. = temporary.

BEGG, N. D., M.D., Med. Supt., Eastern;
FIRMAN, DOREEN P., M.R.C.S., A.M.O. (I), St. Pancras;
ASTON, H. C., M.B., A.M.O. (I), Paddington;
GUTHRIE, D. W., M.B., A.M.O. (II), St. Pancras;
MORGAN, A. D., M.B., A.M.O. (II), Hackney;
O'DONNELL, MARY J., M.B., A.M.O. (II), St. Benedict's;
LAWSON, R. S., M.B., M.S., A.M.O. (II), St. James';
STEVEN, J. M. M., M.D., A.M.O. (II), Highgate;
KENT, A. R. R., M.R.C.S., House Physician, St. James';
FIFE, J. G., M.B., House Surgeon, St. Mary Abbots;
GODWIN, E. G., M.R.C.S., House Physician, St. James';
FOX, RAYMOND, M.B., F.R.C.S., Clinical Assistant, St. Charles';
HOLMES, LAURENCE, M.B., Visiting M.O. (Temp.) and D.M.O. (Temp.), Goldie Leigh;
CRAIG, N. S., M.D., Med. Supt., Mile End;
MITMAN, MAURICE, M.D., M.R.C.P., Med. Supt., River;
SEARS, W. G., M.D., M.R.C.P., Med. Supt., St. Peter's;
HEALY, J. W., M.D., Deputy Med. Supt. (II), Southern;
CUNNINGHAM, A. A., M.D., M.R.C.P., Deputy Med. Supt. (II), Park;
MUIR, CLEMENT, M.R.C.P., Senior A.M.O. (I), North-Western;
TAYLOR, IAN, M.R.C.P., Senior A.M.O. (I), South-Western;
SIMMONS, J. H., M.D., Deputy Med. Supt. (II), St. Charles';
HURFORD, J. V., M.D., M.R.C.P., Senior A.M.O. (II), Colindale;
MCDADE, R. S. C., M.B., Senior A.M.O., High Wood;
BROWN, W. D., M.B., Senior A.M.O. (II), St. Nicholas';
PEARSON, H. E. S., M.D., M.R.C.P., Senior A.M.O. (II), St. Andrew's;
BYRNE, P. A., M.B., A.M.O. (I), St. Alfege's;
THOMPSON, N. J. W., M.B., A.M.O. (II), Archway;
BIRRELL, N. V., M.B., A.M.O. (I), South-Eastern;
CANN, A. M. R., M.B., A.M.O. (I), Brook;
HUNTER, ALEXANDER, M.D., Deputy Med. Supt. (II), Northern;
MCENTEE, J. C. J., M.D., M.R.C.P., Deputy Med. Supt. (II), Grove; and
MASON, J. H. G., M.D., Senior A.M.O. (I), St. Olave's.

Births, Marriages, and Deaths

BIRTHS

BRAYBROOKS.—On August 1st, at Sutherland-avenue, W., the wife of Dr. J. R. Braybrooks, of Thames Ditton, of a daughter.
FARIS.—On July 23rd, at Singapore, the wife of Dr. D. W. G. Faris, Malayan Medical Service, of a daughter.
JACKSON.—On August 4th, at Somertrees-avenue, Grove Park, S.E., to Dr. Eileen Jackson, wife of W. Eric Jackson, LL.B.—a daughter.
JAMESON EVANS.—On August 2nd, the wife of Mr. Philip Jameson Evans, F.R.C.S., of a son.
WHATELEY-DAVIDSON.—On August 4th, the wife of Dr. S. Whateley-Davidson, Newcastle-upon-Tyne, of a son.

DEATHS

BASTIAN.—On August 2nd, at University College Hospital, William Bastian, M.R.C.S. Eng., Surgeon-Captain, R.N. (retd.), of Loughborough, third son of the late H. Charlton Bastian, M.D., F.R.S.
BROWN.—On August 4th, at a nursing-home in Edinburgh, William Moore Brown, M.B. Glasg., formerly of Caterham Valley and Croydon, aged 80.
D'ALBON.—On August 6th, Mark D'Albon, M.D. Penna, L.R.C.P. Edin., of Bishop's-road, Bayswater, W.
HOPGOOD.—On August 6th, at Hastings, William Charles Hopgood, M.R.C.S. Eng., L.R.C.P. Edin.
JOWERS.—On August 7th, at Palmeira-avenue, Hove, Reginald Francis Jowers, F.R.C.S. Eng.
MONTESOLE.—On August 4th, at Juan-les-Pins, Max Herschel Edward Richard Montesole, M.B., B.S. Lond., M.R.C.S. Eng., of Finchley.
ROSS.—On July 25th, at Capetown, J. J. Ross, M.B. Edin., youngest son of the late Lt.-Col. A. A. Ross, The Leicestershire Regiment.
SHILLITO.—On August 8th, Lancelot Shillito, M.B. Camb., M.R.C.S. Eng., of Boreham-street, Hurstmonceux.
SMITH.—On August 7th, at Blenkarne-road, S.W., Edwin Smith, M.D. Lond., Barrister-at-Law, H.M. Coroner for West London.
STABLES.—On August 10th, at Auckland-road, Upper Norwood, S.E., W. W. Godfrey Stables, L.R.C.P. Edin., M.R.C.S. Eng., in his 92nd year.
STOTHERT.—On August 4th, drowned while canoeing in Austria, John Henry Stothert, M.B., B.Chir. Camb., only child of the late Sir Percy K. Stothert, K.B.E., and Lady Stothert, Bath, aged 27.
VERGE.—On August 5th, at Lexham-gardens, Kensington, Charles H. Verge, M.D. Laval, M.C.P.S. Ont., in his 71st year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

WARNEFORD HOSPITAL, LEAMINGTON.—The committee of management has decided not to proceed with the erection of the new maternity block and clinic. The sum of £20,000 has already been subscribed towards it, but, in view of increased building costs and with the support of the anonymous donor of half the money, it has been thought wiser not to continue with the scheme.

[3] *Ann. Derm. Syph., Paris*, 1907, p. 387.
[4] The Influence of Sunlight in the Production of Cancer of the Skin. London. 1918. Cutaneous Neoplasms. London. 1933.